

CDP-228ESD

SERVICE MANUAL

AEP Model
UK Model



Model Name Using Similar Mechanism	New
CD Transport Mechanism Type	KSS-151A
Optical Pick-Up Block Type	BU-6B

SPECIFICATIONS

Compact disc player

Frequency response	2 Hz – 20 kHz $\pm$ 0.5 dB
Signal to noise ratio	More than 110 dB
Dynamic range	More than 100 dB
Harmonic distortion	Less than 0.0025%
Channel separation	More than 105 dB

Outputs

LINE OUT (FIXED) (phono jacks)	Output level 2 V (at 50 kilohms) Load impedance over 10 kilohms
LINE OUT (VARIABLE) (phono jacks)	Output level max. 2 V (at 50 kilohms) Load impedance over 50 kilohms
DIGITAL OUT (COAXIAL) (cable)	Output level max. 0.5 Vp-p Load impedance 75 ohms
DIGITAL OUT (OPTICAL) (optical output connector)	Wave length 660 nm Output level – 18 dBm
HEADPHONES (stereo phone jack)	Output level max. 28 mW Load impedance 32 ohms

General

Power	AEP Model : 220 V AC (or 240 V AC adjustable by Sony personnel), 50/60 Hz UK Model : 240 V AC (or 220 V AC adjustable by Sony personnel), 50/60 Hz
Power consumption	18 W
Dimensions (approx., including projections)	430 $\times$ 120 $\times$ 340 mm (w/h/d) (16 ⁹ / ₁₀ $\times$ 4 ⁷ / ₁₀ $\times$ 13 ¹ / ₂ inches)
Weight (approx.)	12.5 kg (27 lbs 11 oz)

— continued on next page —

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK Δ OR DOTTED LINE WITH MARK Δ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.



COMPACT DISC PLAYER
SONY®

Remote commander

Remote control system	Infrared control
Power requirements	3 V DC with two batteries size AA (IEC designation R6)
Dimensions	67×20×175 mm (w/h/d) (2 ⁷ / ₁₆ ×1 ¹ / ₁₆ ×7 inches)
Weight	135 g (4.7 oz) Including batteries

Supplied accessories

Connecting cord	1 (2 phono plugs ↔ 2 phono plugs)
Remote commander	1
Size AA batteries	2

Design and specifications subject to change without notice.

TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
1. GENERAL		
1-1.	Location of Controls.....	3
2. ELECTRICAL ADJUSTMENTS		4
3. DIAGRAMS		
3-1.	Printed Wiring Boards.....	7
3-2.	Schematic Diagram.....	11
3-3.	Circuit Boards Location	14
3-4.	Semiconductor Lead Layouts	16
4. EXPLODED VIEWS		
4-1.	Cover Section	19
4-2.	Front Panel Section	20
4-3.	Mechanism Section	21
4-4.	Optical Pick-Up Block Section	22
5. ELECTRICAL PARTS LIST		23

SERVICING NOTE

NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

The laser diode in the optical pick-up block may suffer electrostatic breakdown because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body.
During repair, pay attention to electrostatic breakdown and also use the procedure in the printed matter which is included in the repair parts.
The flexible board is easily damaged and should be handled with care.

CAUTION

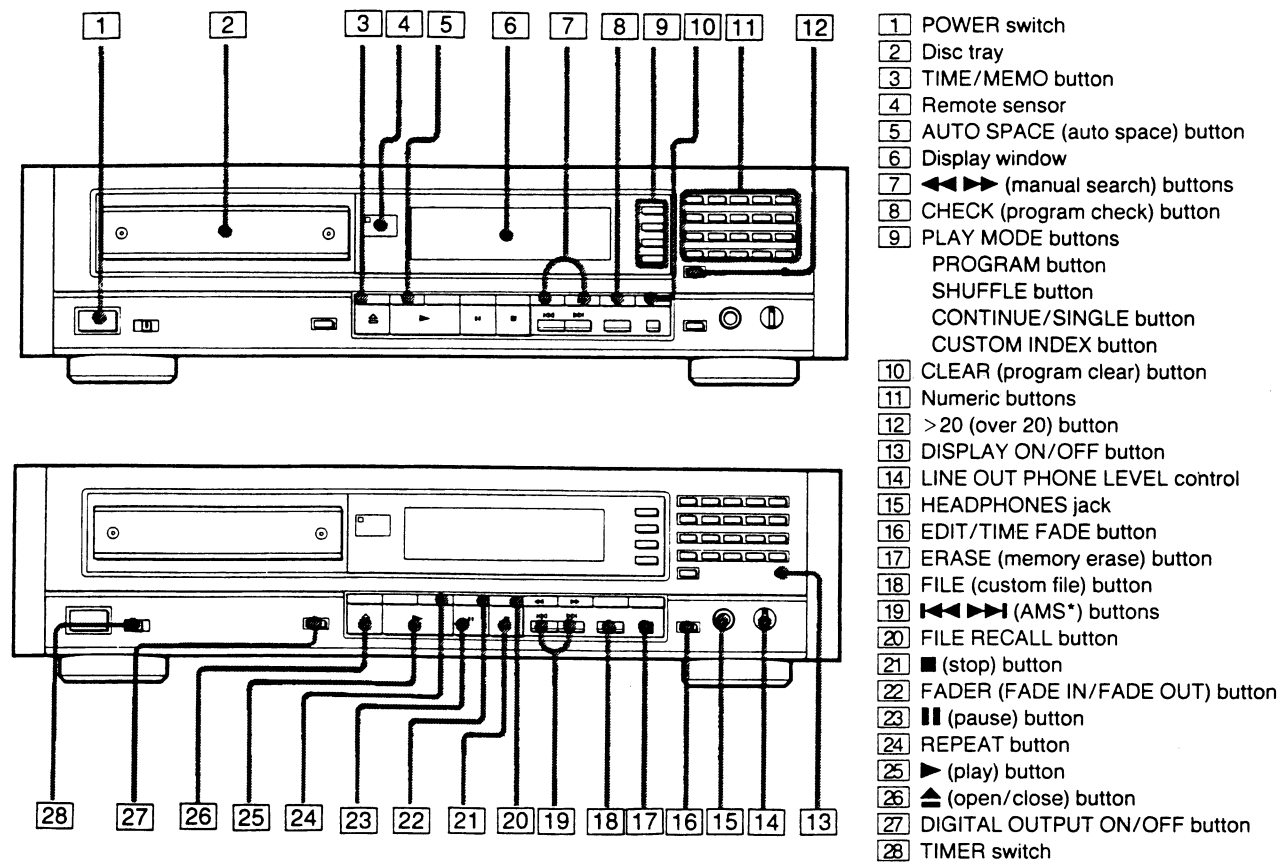
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

NOTES ON LASER DIODE EMISSION CHECK

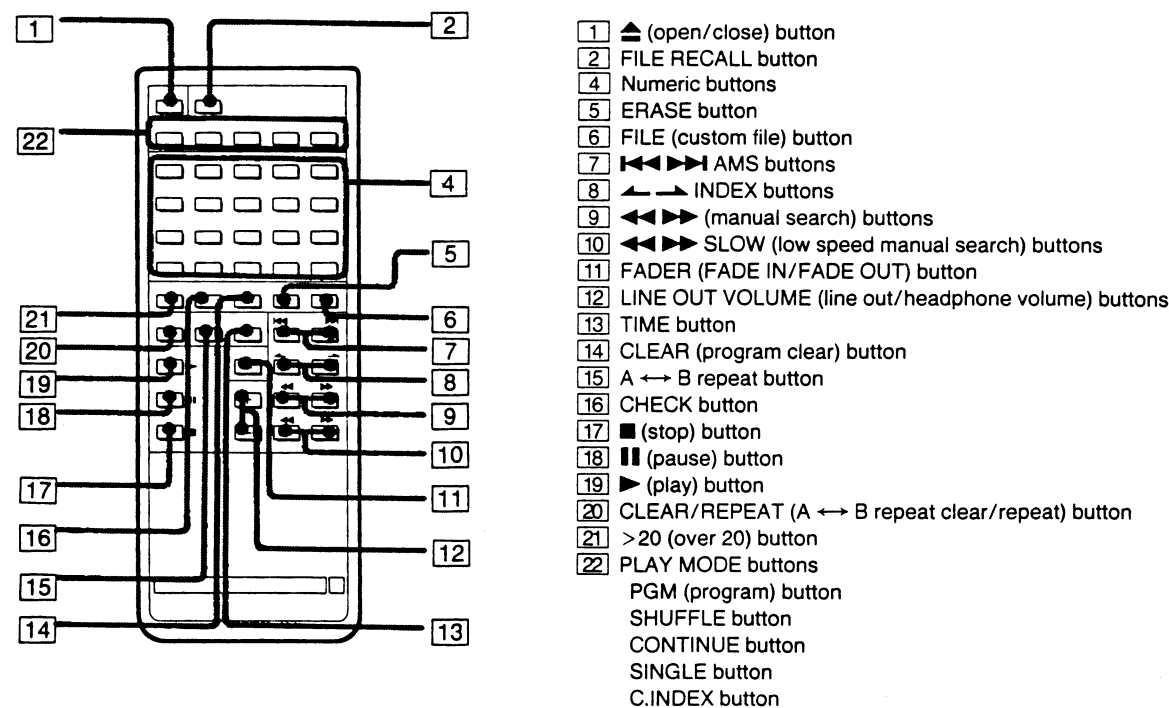
The laser beam on this model is concentrated so as to be focused on the disc reflective surface by the objective lens in the optical pick-up block. Therefore, when checking the laser diode emission, observe from more than 30 cm away from the objective lens.

SECTION 1 GENERAL

1-1. LOCATION OF CONTROLS



* AMS is the abbreviation of Automatic Music Sensor.

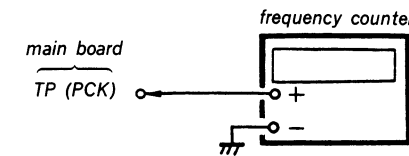


SECTION 2 ELECTRICAL ADJUSTMENTS

1. Perform adjustments in the order given.
2. Use YEDS-18 (Part No: 3-702-101-01) disc unless otherwise indicated.
3. Use the oscilloscope with more than 10 MΩ impedance.

RF PLL Frequency Adjustment

Procedure :

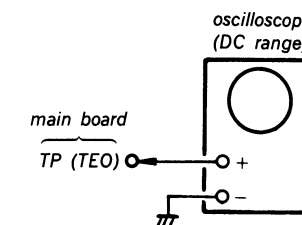


1. Connect the frequency counter to test point TP (PCK).
2. Turn POWER switch on.
3. Adjust RV201 so that the reading on the frequency counter is 4.3218MHz ±30kHz.
4. Put disc (YEDS-18) in and press ▷ button.
5. Confirm that the reading on frequency counter is 4.3218MHz.

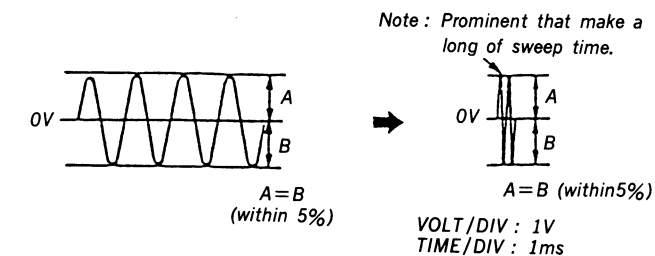
E-F Balance Adjustment

This adjustment should be made when replacing TOP (T-type Optical Pick-up).

Procedure :



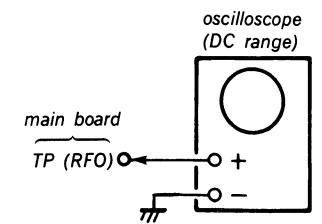
1. Connect oscilloscope to test point TP (TEO).
2. Connect test point TP (ADJ) and test point TP (TES) to ground with lead wire.
3. Turn POWER switch on.
4. Put disc (YEDS-18) in and press ▷ button.
5. Adjust RV101 so that the traverse waveform is symmetrical above and below.
6. After adjustment, remove the lead wire connected in step 5.



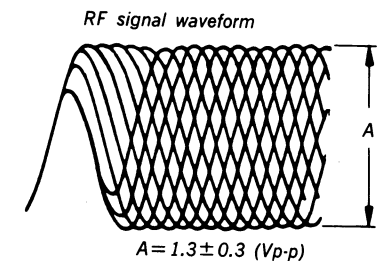
Focus Bias Adjustment

This adjustment should be made when replacing TOP (T-type Optical Pick-up).

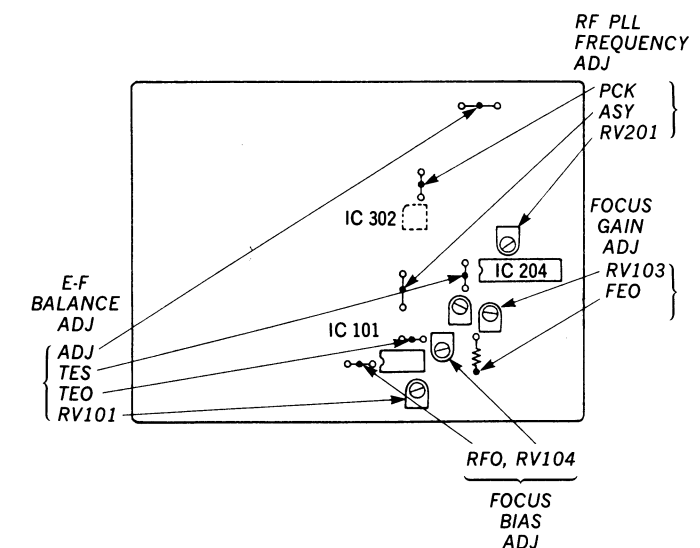
Procedure :



1. Connect oscilloscope to test point TP (RFO).
2. Turn POWER switch on.
3. Put disc (YEDS-18) in and press ▷ button.
4. Adjust RV104 for an optimum waveform eye pattern or so that the peak is maximum. Optimum eye pattern means that shape "◇" can be clearly distinguished at the center of the waveform.



Adjustment Location : main board



REFERENCE

Focus/Tracking Gain Adjustments

A frequency response analyzer is necessary in order to perform this adjustment exactly.

However, this gain has a margin, so even if it is slightly off, there is no problem. Therefore, do not perform this adjustment.

Focus/tracking gain determines the pick-up follow up (vertical and horizontal) relative to mechanical noise and shock when the 2-axis device operate.

However, as these reciprocate, the adjustment is at the point where both are satisfied.

- When gain is raised, the noise when the 2-axis device operates increases.
- When gain is lowered, mechanical shock and skipping occurs more easily.
- When gain adjustment is off, the symptoms below appear.

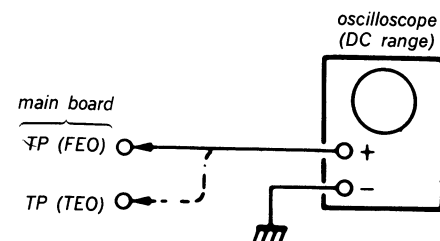
Symptoms \ Gain	Focus	Tracking
• The time until music starts becomes longer for $\blacksquare \rightarrow \triangleright$ or automatic selection. ($\llcorner$, $\triangleright$ buttons pressed.) (Normally tapes about 1 seconds.)	low	low or high
• Music does not start and disc continues to rotate for $\blacksquare \rightarrow \triangleright$ or automatic selection. ($\llcorner$, $\triangleright$ buttons pressed.)	—	low
• Disc table opens shortly after $\blacksquare \rightarrow \triangleright$.	low or high	—
• Sound is interrupted during PLAY or time counter display stops progressing.	—	low
• More noise during 2-axis device operation.	high	high

The following is a simple adjustment method.

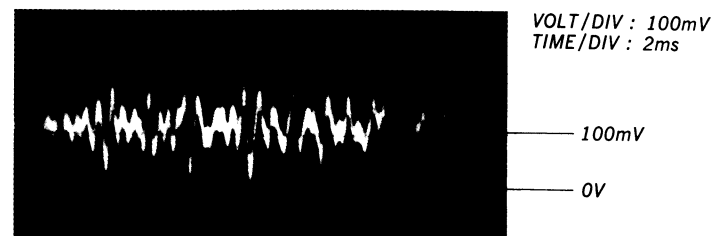
—Primary Adjustment—

Note : Since exact adjustment cannot be performed, remember the positions of the controls before performing the adjustment. If the position after the primary adjustment are only a little different, return the controls to the original position.

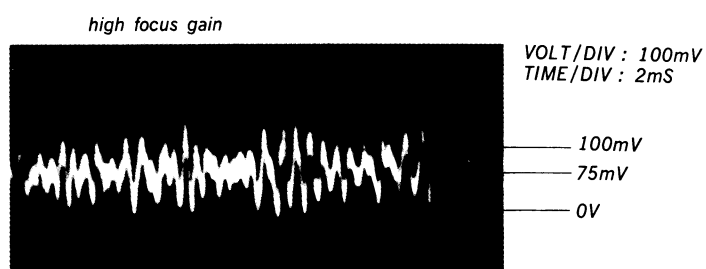
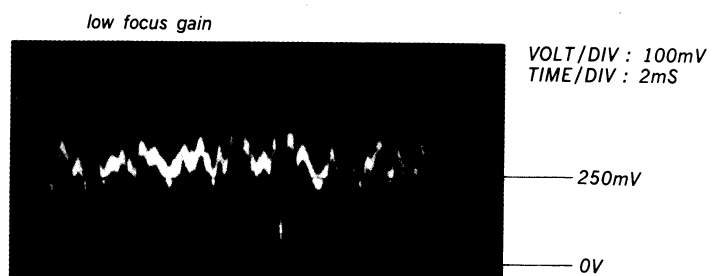
Procedure :



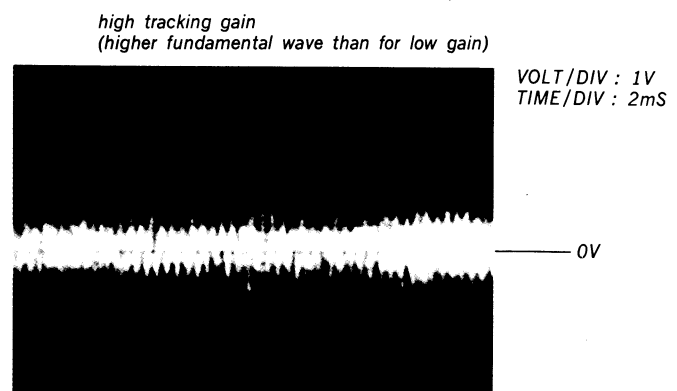
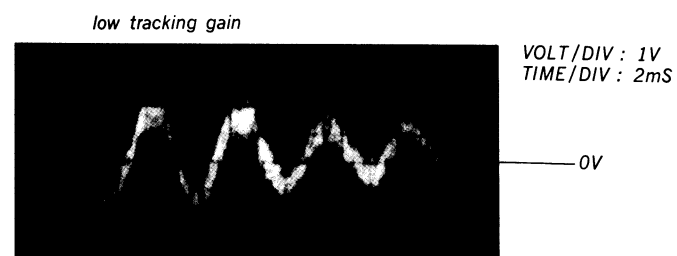
1. Keep the set horizontal.
(If the set is not horizontal, this adjustment cannot be performed due to the gravity against the 2-axis device.)
2. Insert disc (YEDS-18 : Fifth Selection) and press $\triangleright$ button.
3. Connect oscilloscope to main board TP (FEO).
4. Adjust RV103 so that the waveform is as shown in the figure below. (focus gain adjustment)
5. Connect oscilloscope to main board TP (TEO).
6. Adjust RV102 so that the waveform is as shown in the figure below. (tracking gain adjustment)



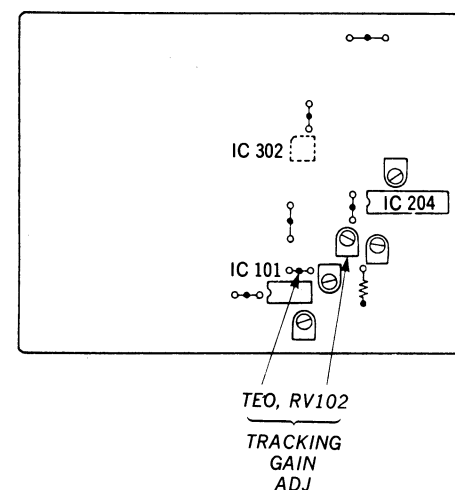
- Incorrect Examples (DC level changes more than on adjusted waveform)



- Incorrect Examples (fundamental wave appears)



Adjustment Location : main board



SECTION 3 DIAGRAMS

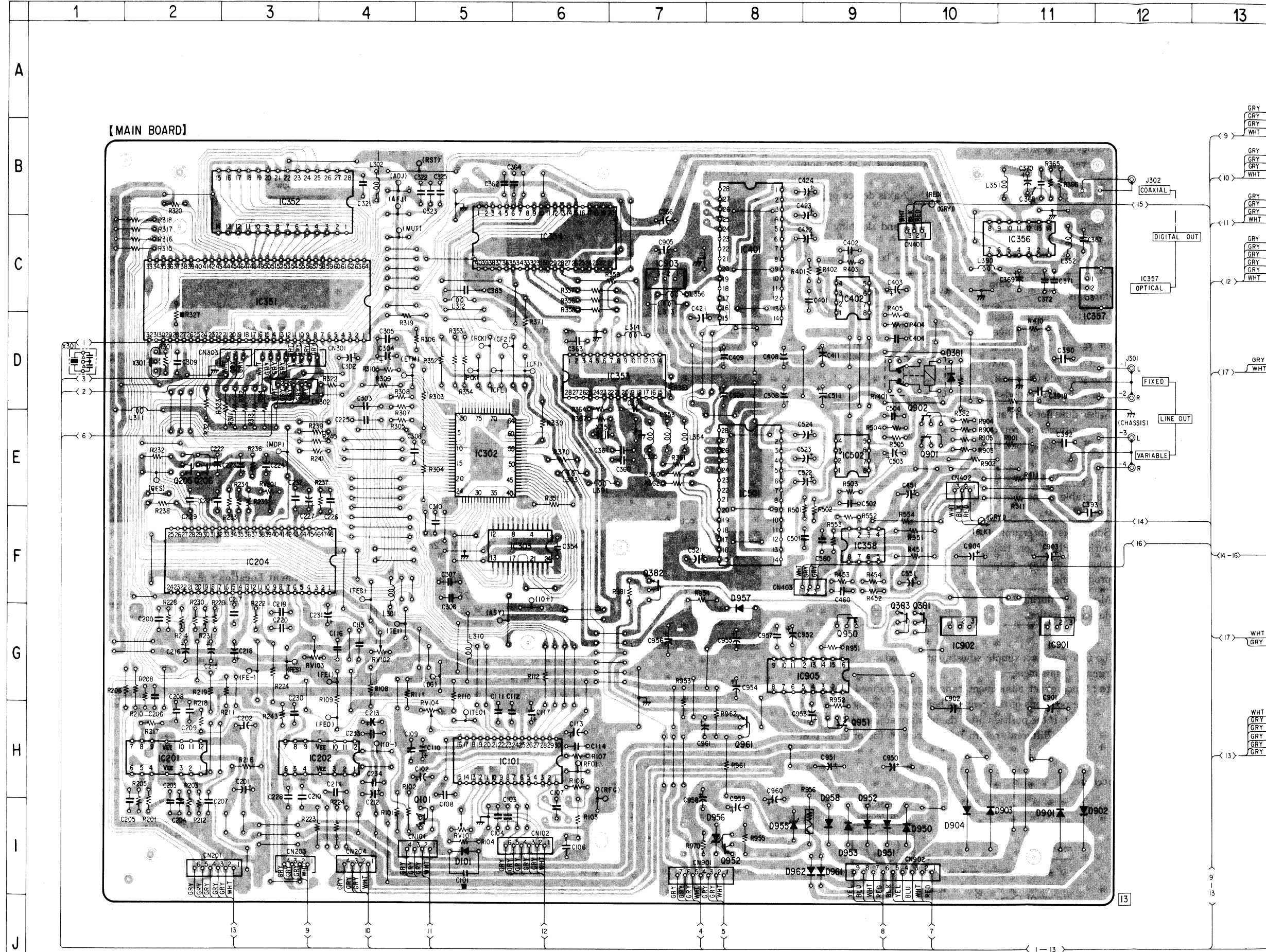
3-1. PRINTED WIRING BOARDS • Refer to page 16 for Semiconductor Lead Layouts.

• Semiconductor Location

Ref.No.	Location	Ref. No.	Location
D101	J-5	Q383	G-9
D381	D-10	Q801	H-20
D391	F-26	Q802	I-21
D802	G-16	Q901	E-10
D901	I-11	Q902	E-10
D902	I-11	Q950	G-9
D903	I-10	Q951	H-9
D904	I-10	Q952	I-8
D950	I-10	Q961	H-8
D951	I-9		
D952	I-9		
D953	I-9		
D955	I-8		
D956	I-8		
D957	G-8		
D958	I-9		
D961	I-9		
D962	I-9		
IC101	H-5		
IC201	H-2		
IC202	H-3		
IC204	F-3		
IC302	E-5		
IC303	F-6		
IC351	C-3		
IC352	B-3		
IC353	D-7		
IC354	C-6		
IC356	C-11		
IC357	C-11		
IC358	F-9		
IC391	E-24		
IC401	C-8		
IC402	C-9		
IC501	E-8		
IC502	E-9		
IC801	I-21		
IC802	I-17		
IC901	G-11		
IC902	G-10		
IC903	C-7		
IC905	G-9		
Q101	I-5		
Q205	E-2		
Q206	E-2		
Q381	G-10		
Q382	F-7		

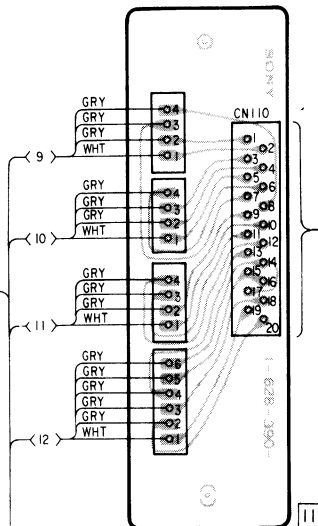
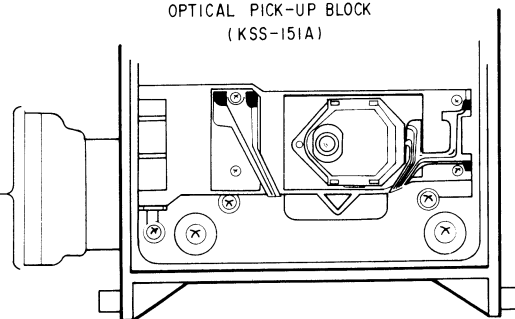
Note on Printed Wiring Board:

- : parts extracted from the component side.
- : parts mounted on the conductor side.
- indicates side identified with part number.
- : Jumper wire connected to the ground pattern on the component side.

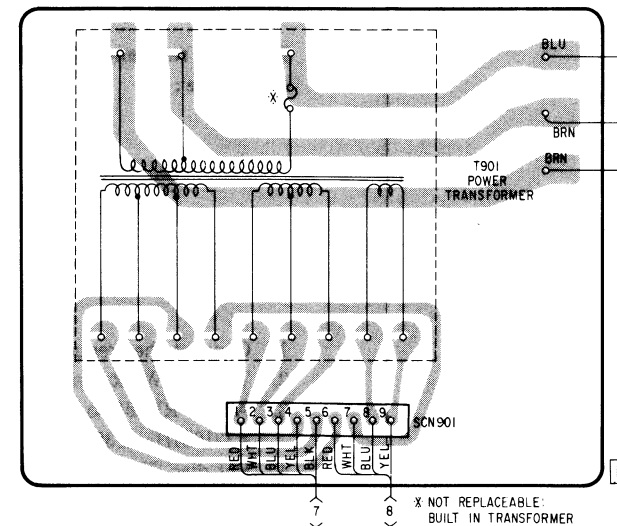


11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27

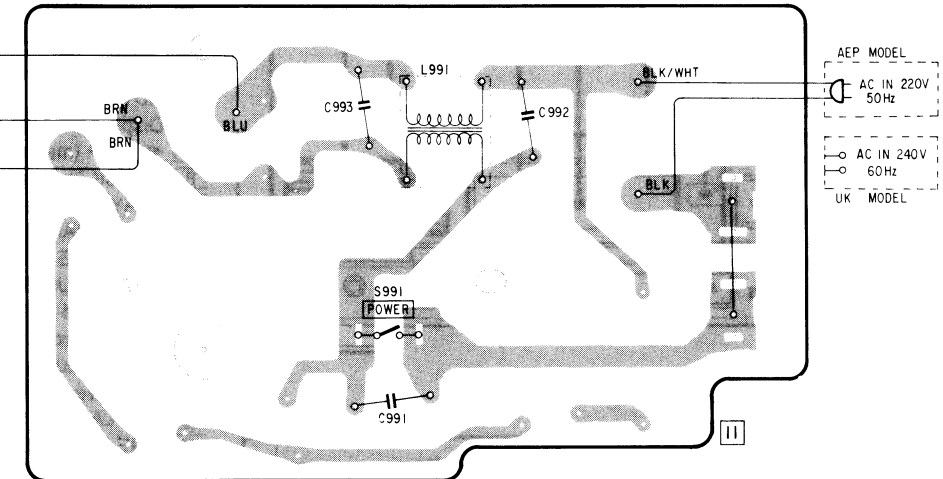
[TRANSLATION BOARD]

BU-6B
OPTICAL PICK-UP BLOCK
(KSS-151A)

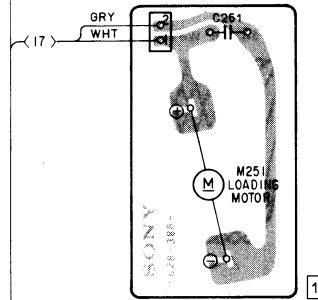
[TRANSFORMER BOARD]



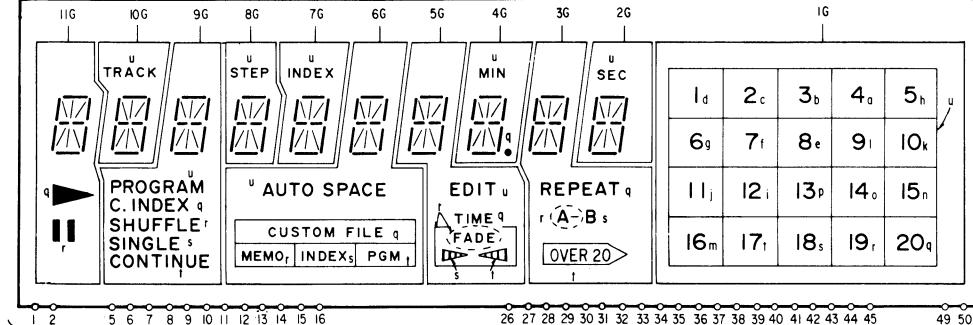
[POWER SWITCH BOARD]



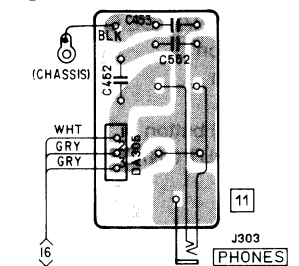
[L. MOTOR BOARD]



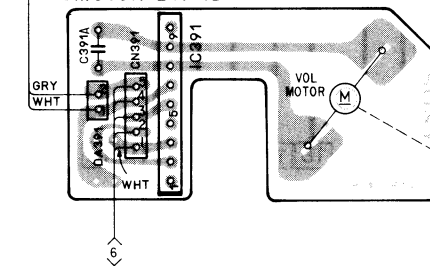
FLD801 FLUORESCENT INDICATOR TUBE



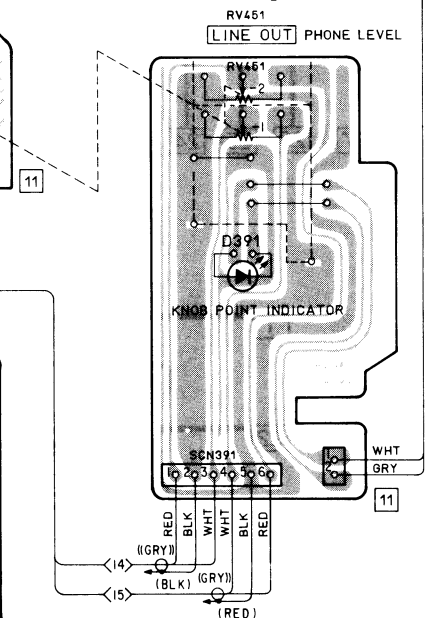
[HEADPHONE JACK BOARD]



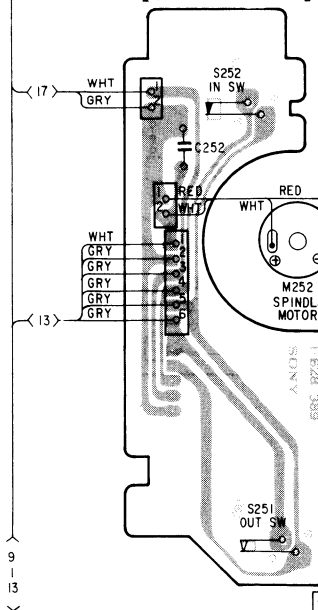
[MOTOR BOARD]



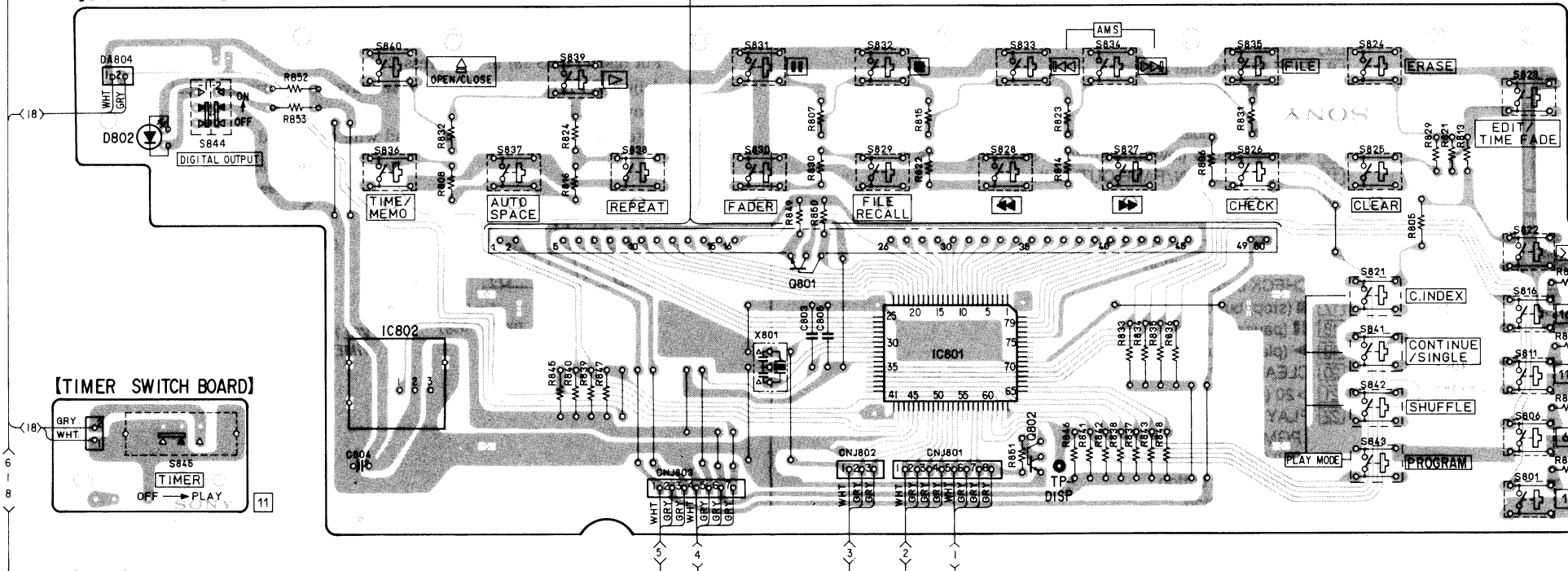
[VR BOARD]



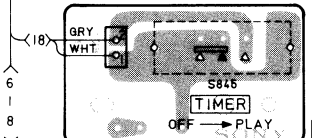
[SWITCH BOARD]



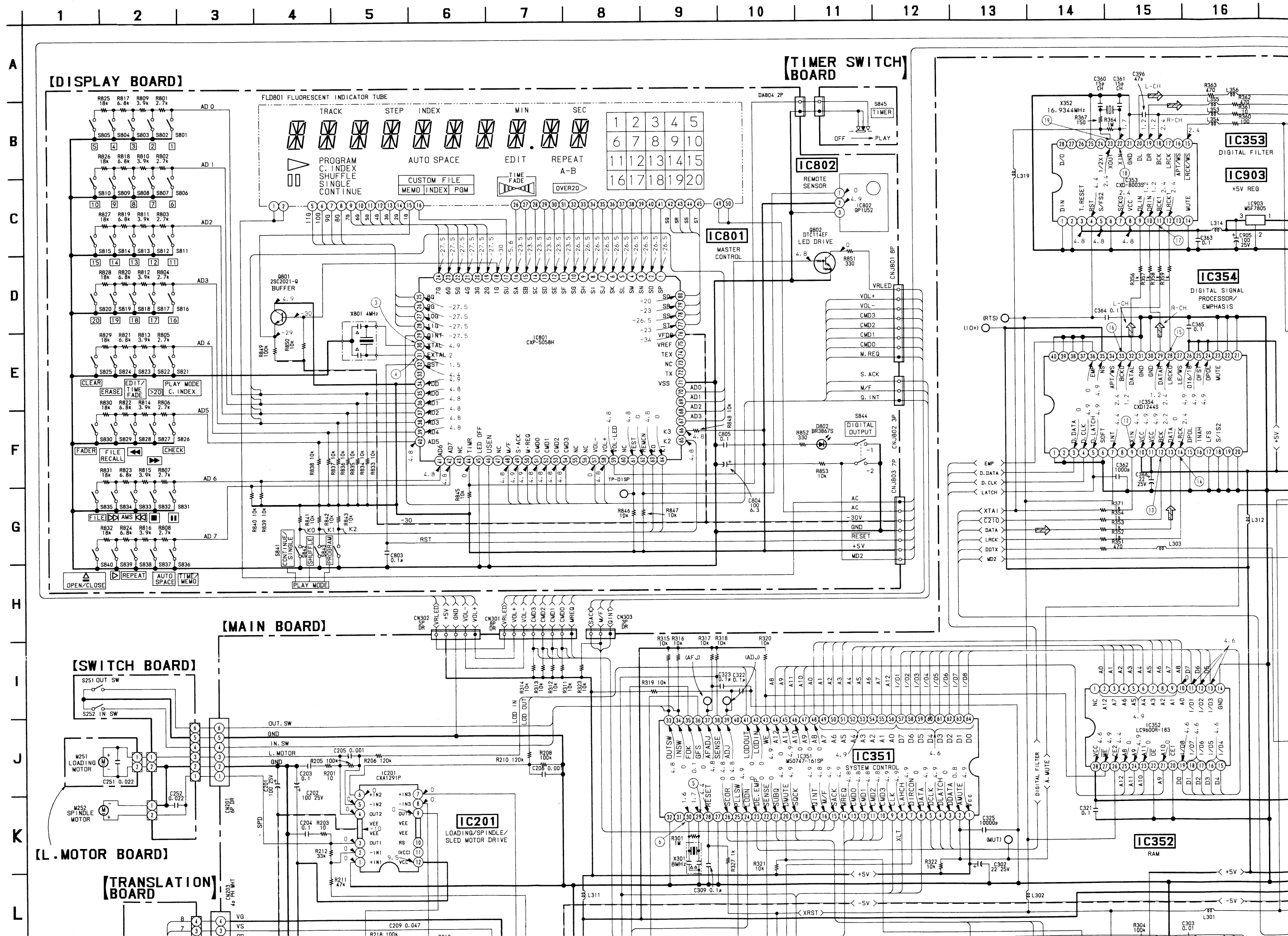
[DISPLAY BOARD]

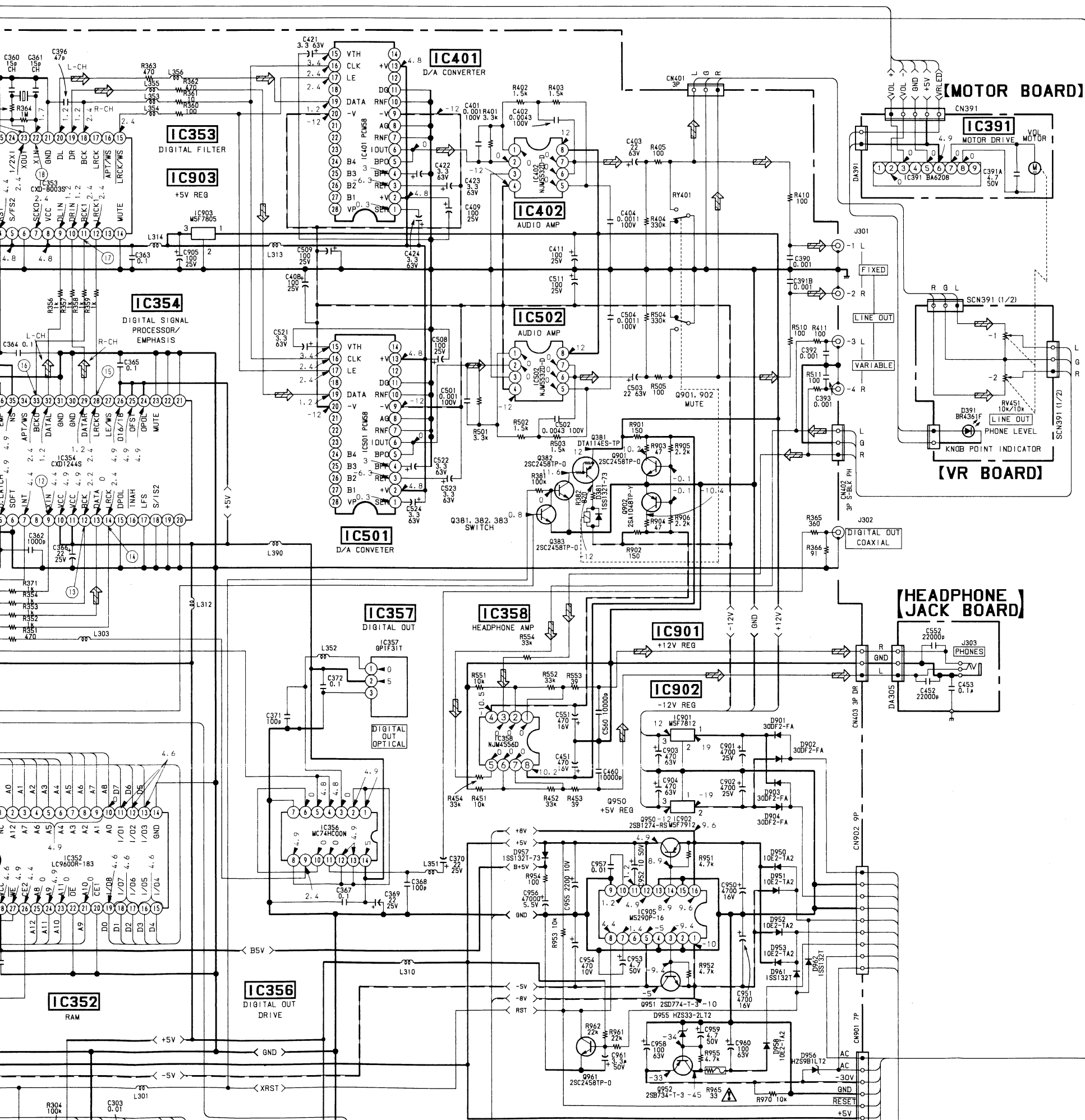


[TIMER SWITCH BOARD]

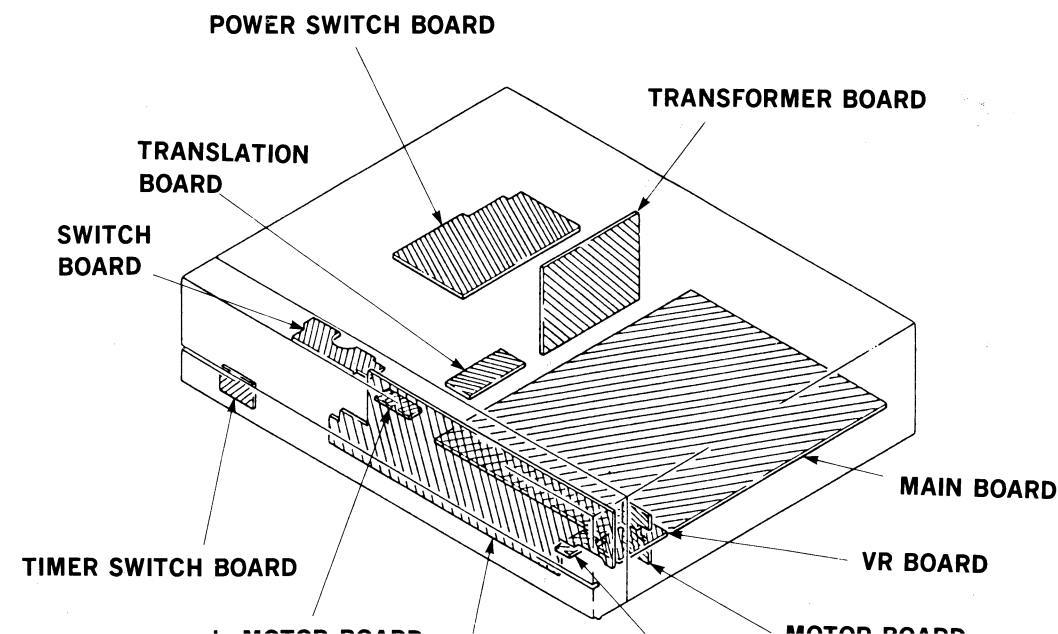


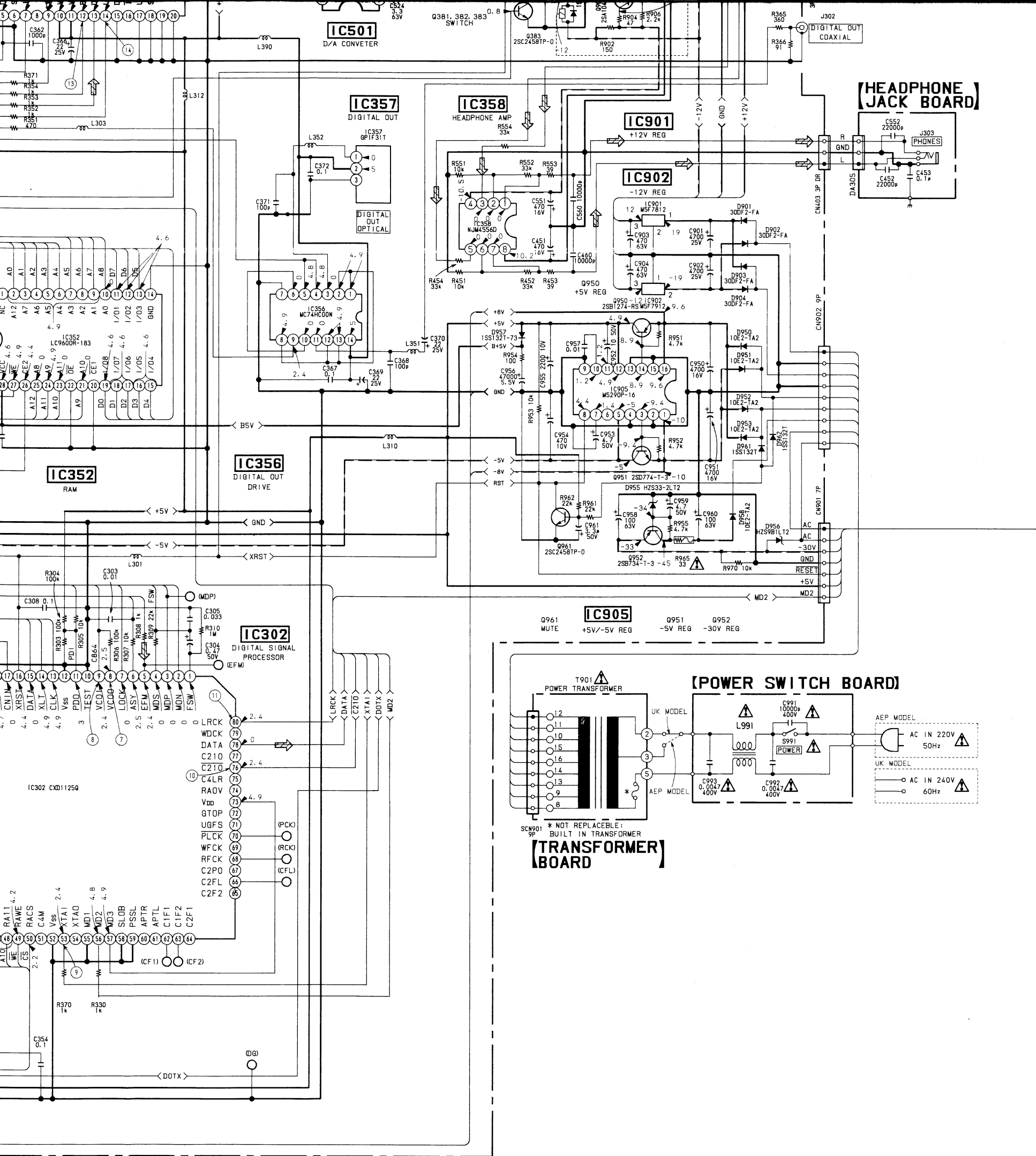
3-2. SCHEMATIC DIAGRAM • Refer to page 15 for Waveforms.



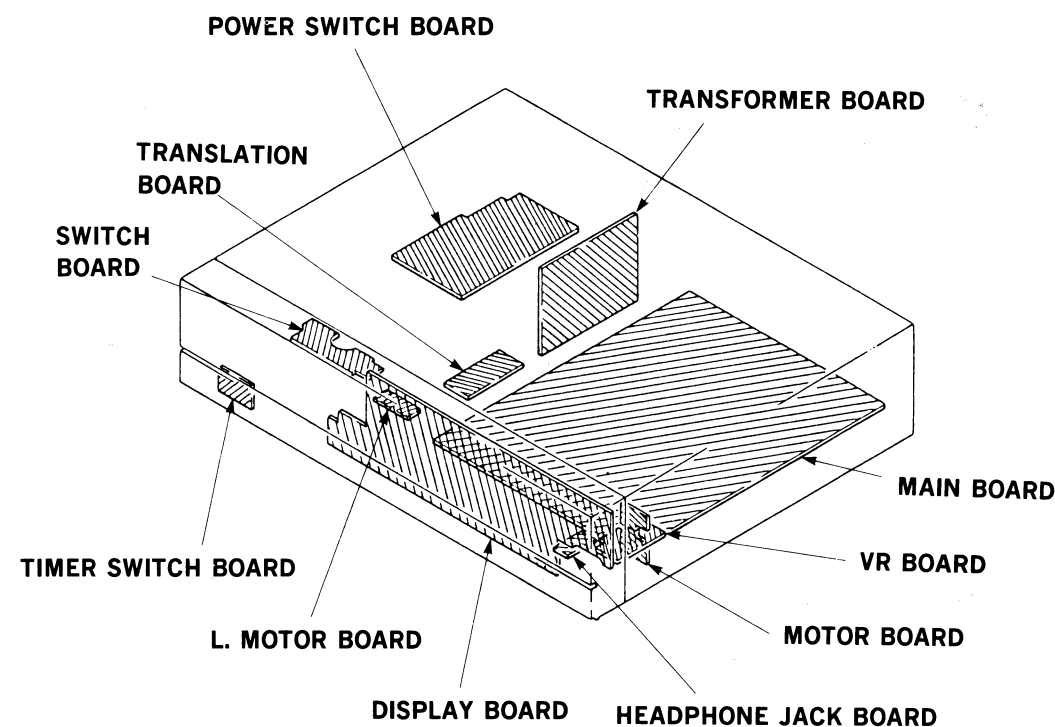


3-3. CIRCUIT BOARDS LOCATION





3-3. CIRCUIT BOARDS LOCATION

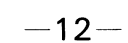


Note on Schematic Diagram:

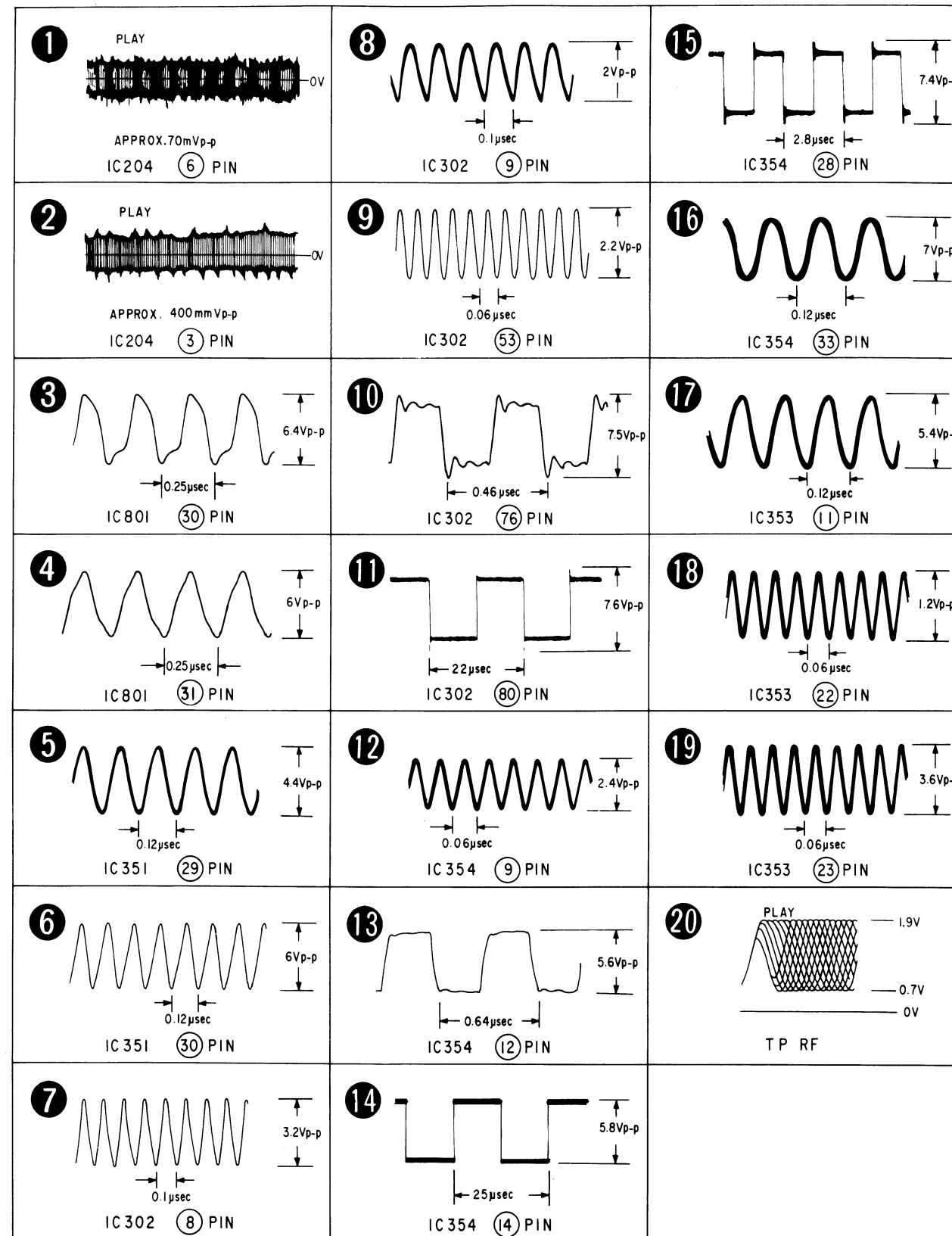
- All capacitors are in μF unless otherwise noted. pF : μF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $\frac{1}{4}\text{W}$ or less unless otherwise specified.
- % : indicates tolerance.
- $\triangle$: internal component.
- --- : fusible resistor.

Note: The components identified by mark $\triangle$ or dotted line with mark $\triangle$ are critical for safety. Replace only with part number specified.

- --- : B+ Line
- --- : B- Line
- --- : adjustment for repair.
- Voltage and waveforms are dc with respect to ground under no-signal conditions.
no mark: STOP
() : PLAY
- Voltages are taken with a VOM (Input Impedance $10\text{M}\Omega$). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
- --- : CD



• Waveforms

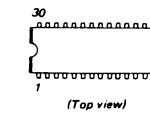


3-4. SEMICONDUCTOR LEAD LAYOUTS

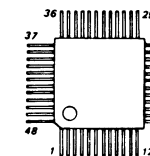
BA6208



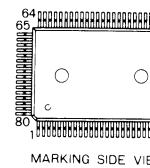
CXA1081S



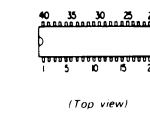
CXA1182S



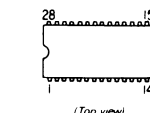
CXD1125Q
CXP5058H-603Q



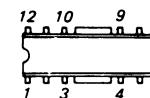
CXD1244S



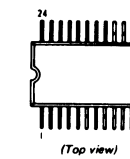
CXD8003S
LC9600R-183
PCM58P-J



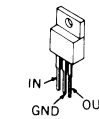
CXA1291P



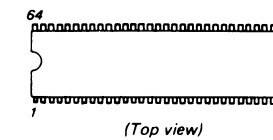
CXK5816M-12L



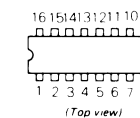
M5F7805
M5F7812
M5F7912



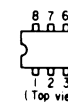
M50747-161SP



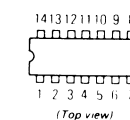
M5290P-16



RC4556D
RC5532D-D



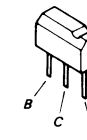
TC74HC00P



DTA114ES
DTC114ES
2SA1175-HFE
2SC2785-HFE



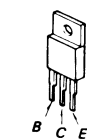
DTC114EF
2SC2021-Q



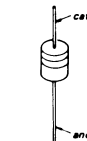
2SB734-34
2SD774-3



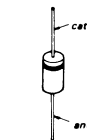
2SB1274



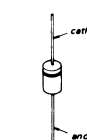
HZS33-2L
HZS9B-2L



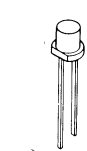
1SS202-1
10E2



30DF2

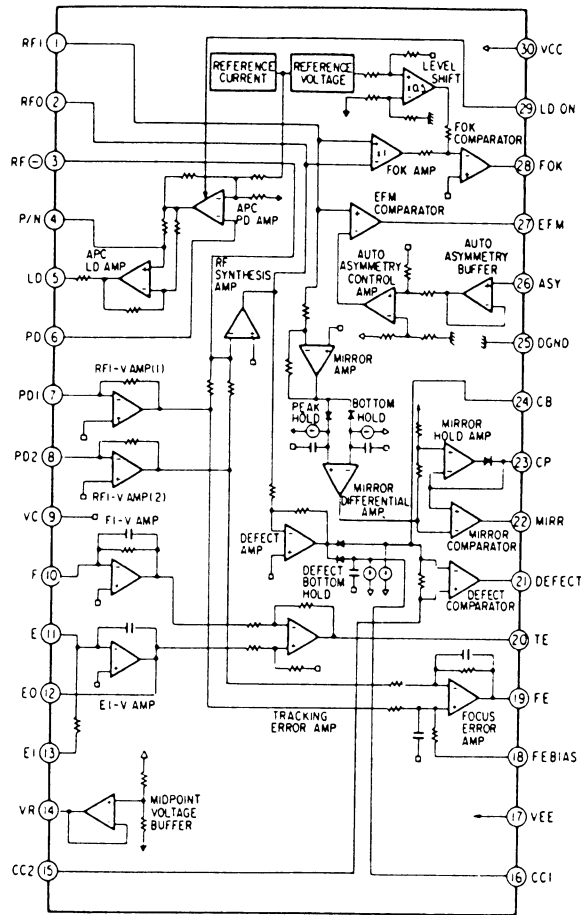


BR3867S
BR4361F

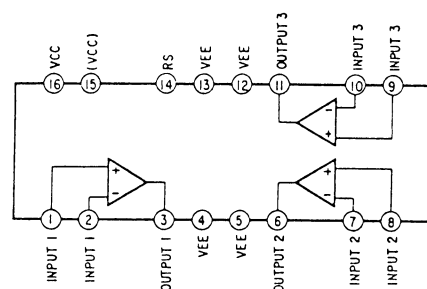


• IC Block Diagrams

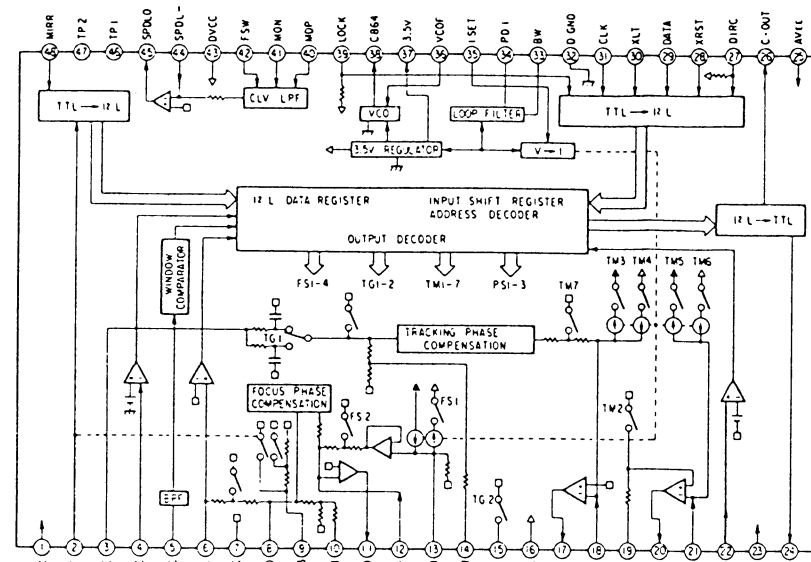
IC101 CXA1081S



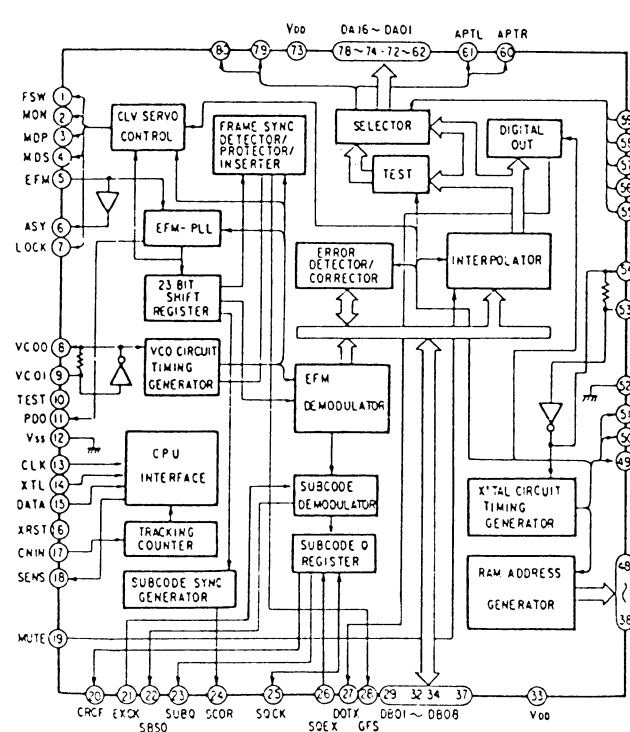
IC201, 202 CXA1291P



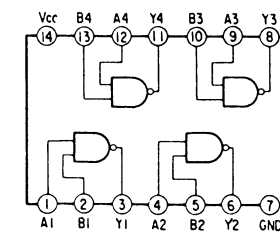
IC204 CXA1182S



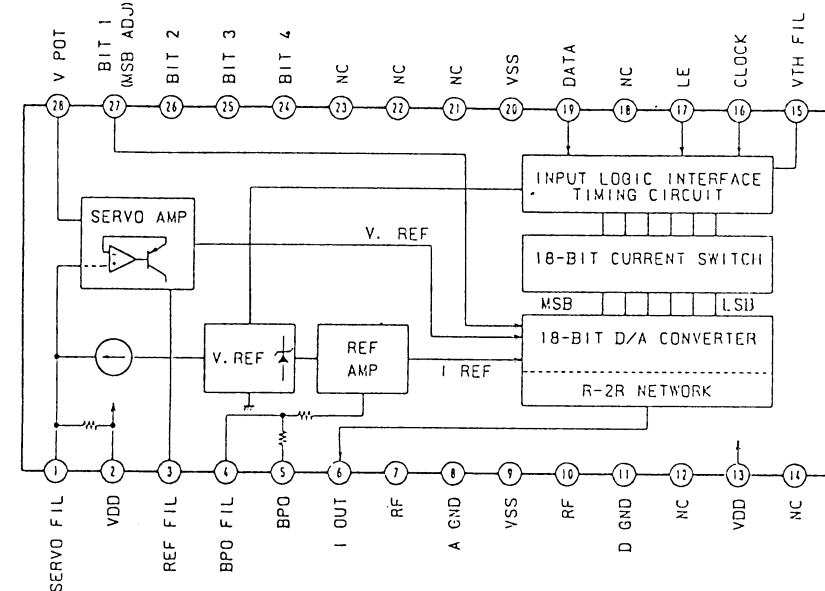
IC302 CXD1125Q



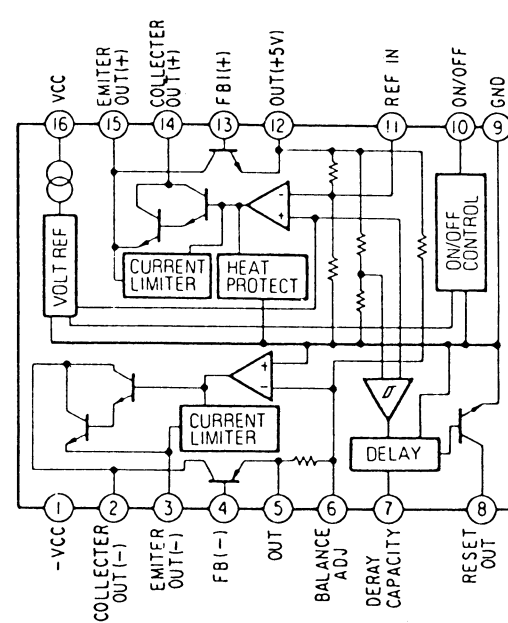
IC356 TC74HC00P



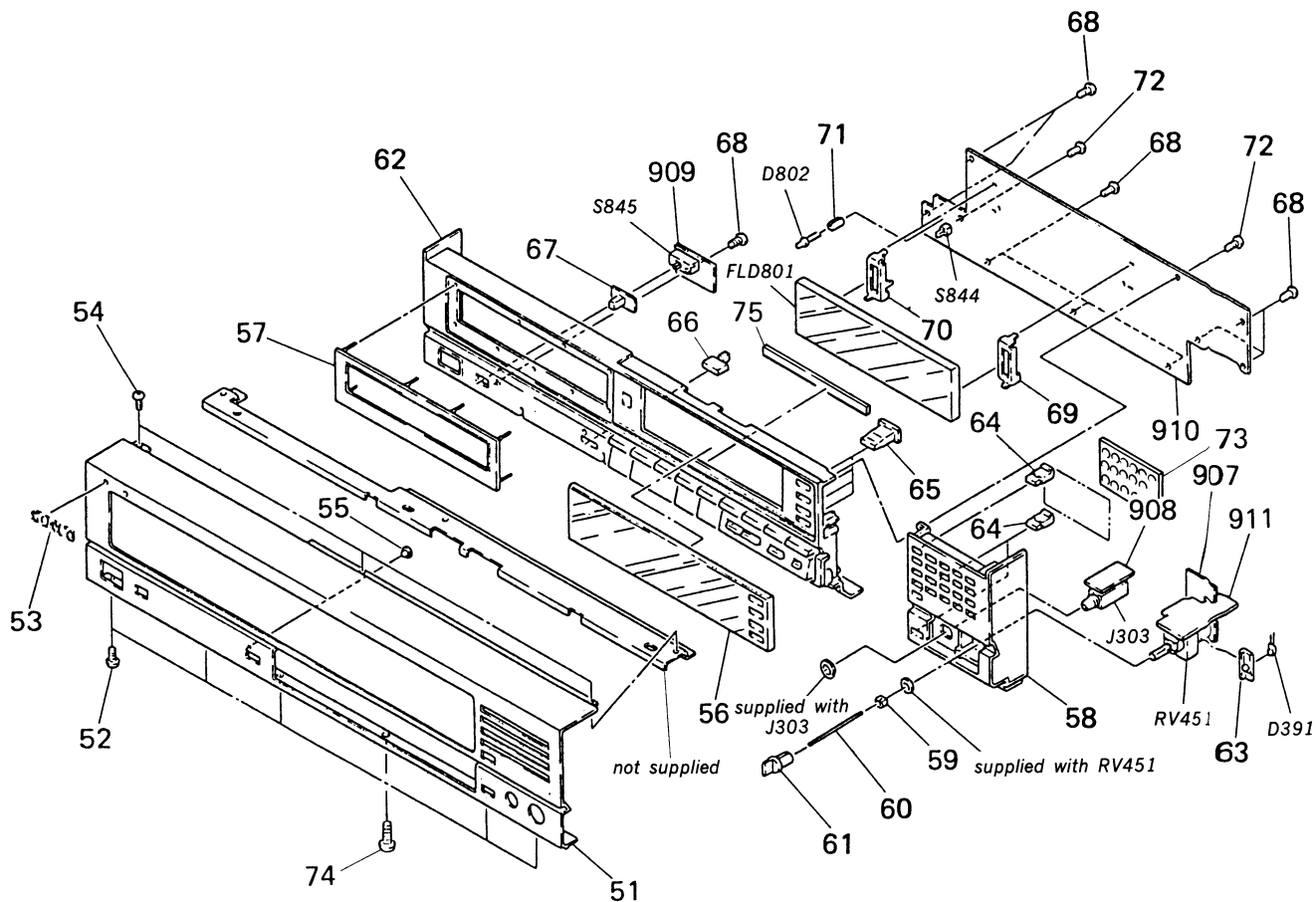
IC401, 501 PCM58P-J



IC905 M5290P-16



4-2. FRONT PANEL SECTION



Ref.No	Part No.	Description	Remarks
51	4-925-319-04	PANEL (FRONT)	
52	7-685-534-19	SCREW +BTP 2.6X8 TYPE2 N-S	
53	4-908-848-01	EMBLEM, SONY	
54	7-621-770-87	SCREW	
55	4-925-327-01	INDICATOR	
56	4-925-330-01	PLATE, INDICATION	
57	4-925-323-01	PACKING (LOADING)	
58	4-925-321-01	PANEL (SUB-RIGHT)	
59	4-922-978-01	HOLDER (FIBER)	
60	4-922-979-01	INDICATOR	
61	4-922-977-01	KNOB (HP)	
62	X-4922-542-1	PANEL (SUB-L) ASSY	
63	* 4-922-980-01	HOLDER (LED)	
64	4-927-604-01	BUTTON (MC)	
65	4-927-605-01	BUTTON (MODE)	
66	4-925-326-01	BUTTON (D/A)	
67	4-922-518-11	KNOB (TIMER)	
68	7-685-134-19	SCREW +BTP 2.6X8 TYPE2 N-S	
69	* 4-922-523-01	HOLDER (RIGHT)	

Ref.No	Part No.	Description	Remarks
70	* 4-922-524-01	HOLDER (LEFT)	
71	* 4-923-532-31	SPACER, LED	
72	7-685-135-19	SCREW +BTP 2.6X10 TYPE2 N-S	
73	* 4-929-021-01	CUSHION (20 KEY)	
74	7-685-133-19	SCREW +BTP 2.6X6 TYPE2 N-S	
75	* 4-929-047-01	SPACER	
907	* 1-628-408-11	PC BOARD, MOTOR	
908	* 1-628-409-11	PC BOARD, HEADPHONE JACK	
909	* 1-628-410-11	PC BOARD, TIMER SWITCH	
910	* A-4655-077-A	MOUNTED PCB, DISPLAY	
911	* 1-628-407-11	PC BOARD, VR	
D391	8-719-970-49	DIODE BR4361F	
D802	8-719-971-70	DIODE BR3867S	
FLD801	1-519-476-11	INDICATOR TUBE, FLUORESCENT	
J303	1-507-796-61	JACK, LARGE TYPE (PHONES)	
RV451	1-238-315-21	RES. VAR. CARBON 10K/10K (LINE OUT) (INCLUDING VOL MOTOR & TPUT)	
S844	1-554-419-00	SWITCH, PUSH (1 KEY) (DIGITAL OUTPUT)	
S845	1-554-481-00	SWITCH, SLIDE (TIMER)	

SECTION 4 EXPLODED VIEWS

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.

- Color Indication of Appearance Parts
Example:

(RED) ... KNOB, BALANCE (WHITE)



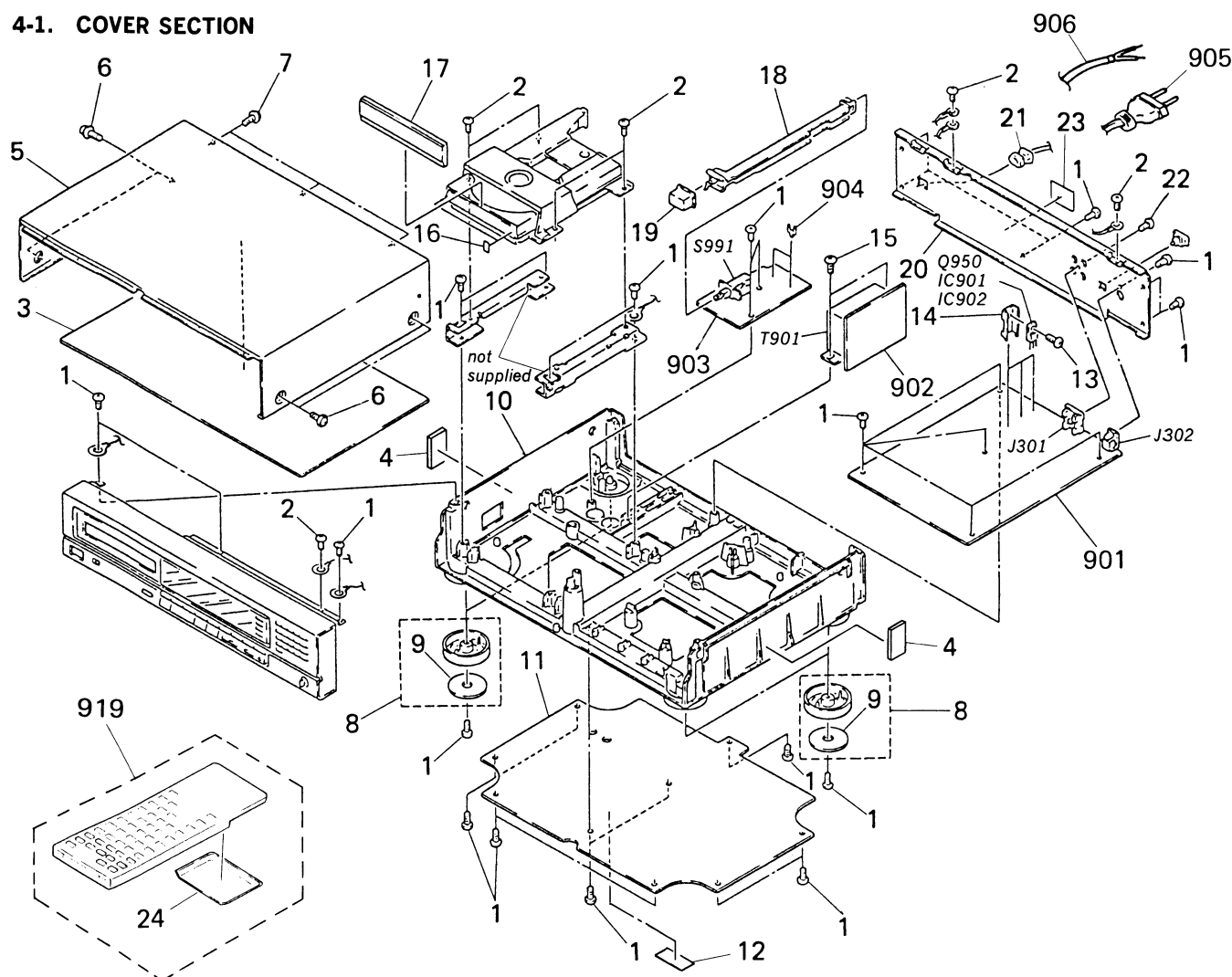
Cabinet's Color



Parts Color

The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

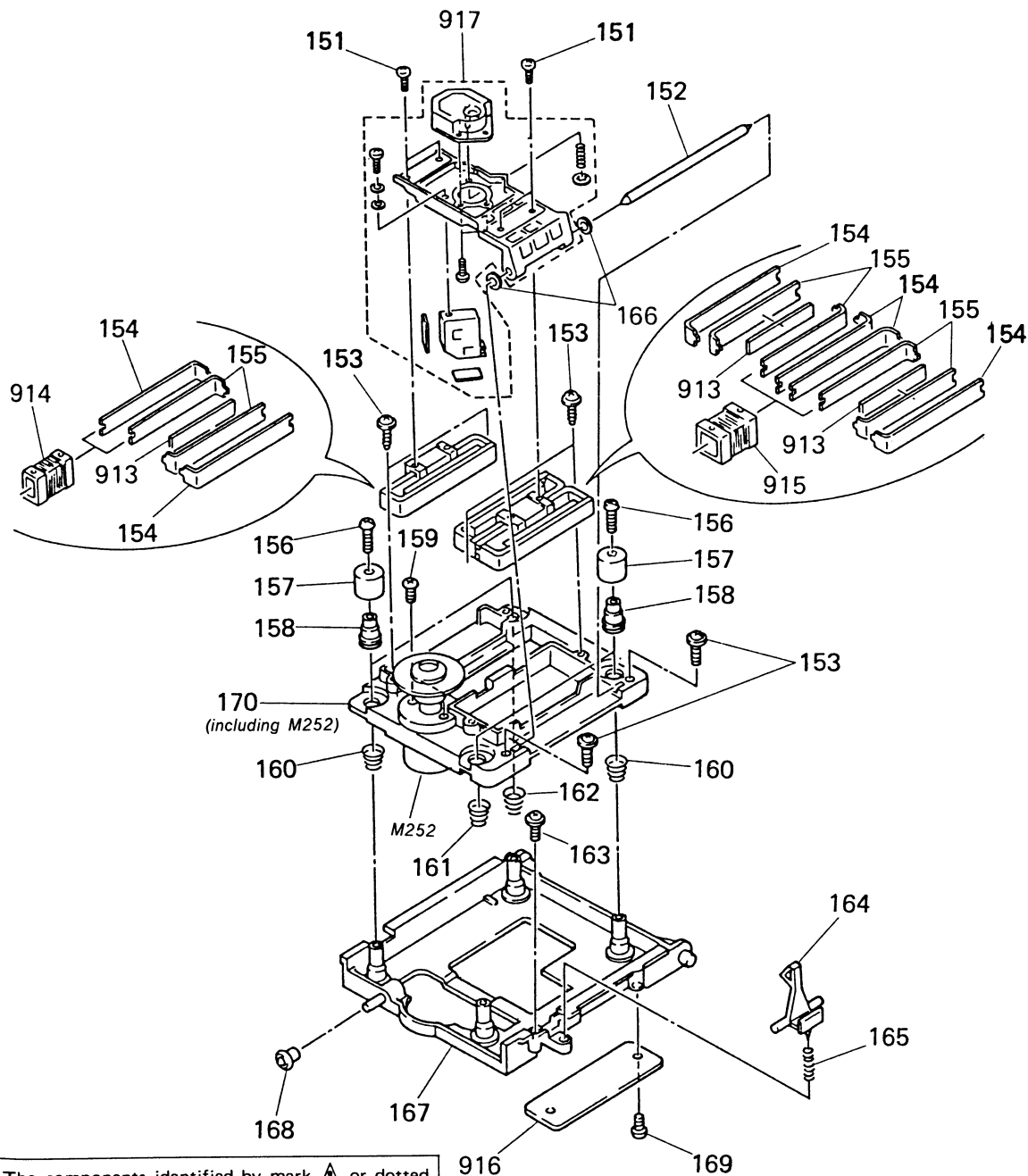
4-1. COVER SECTION



Ref.No	Part No.	Description	Remarks
1	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	
2	7-682-548-04	SCREW +BVTT 3X8 (S)	
3	A-4675-309-A	REINFORCEMENT (TOP PLATE) ASSY	
4	*4-929-007-01	CUSHION (CASE)	
5	4-922-594-01	CASE	
6	7-685-646-79	SCREW, TAPPING	
7	4-886-821-01	SCREW, M3 CASE	
8	X-4922-544-1	FOOT ASSY	9
9	4-922-942-01	FOOT (FELT)	
10	*4-922-928-01	CHASSIS	
11	*4-922-927-62	PLATE, BOTTOM	
12	*3-703-079-21	(UK)...LAVEL, CAUTION (BACK)	
13	7-682-147-15	SCREW, TR	
14	*3-309-144-01	HEAT SINK	
15	7-685-660-11	SCREW +BVTP 4X10 TYPE2 N-S	
16	9-911-830-XX	SHEET, HB	
17	4-925-324-01	PANEL, LOADING	
18	*4-927-610-01	LEVER (POWER)	
19	4-923-520-01	KNOB, POWER	
20	*4-925-329-11	(AEP)...PANEL, BACK	

Ref.No	Part No.	Description	Remarks
20	*4-925-329-21	(UK)...PANEL, BACK	
21	*3-703-244-00	BUSHING (2104), CORD	
22	4-909-982-01	SCREW, TAPPING	
23	*4-885-838-00	LABEL, CLASS 1	
24	4-928-079-01	COVER, BATTERY	
901	*A-4618-226-A	MOUNTED PCB, MAIN	
902	*1-628-937-11	PC BOARD, TRANSFORMER	
903	*1-628-936-11	PC BOARD, POWER SWITCH	
904	*1-535-688-11	TERMINAL	
905	△1-555-795-00	(AEP)...CORD, POWER	
906	△1-556-035-00	(UK)...CORD, POWER	
919	1-465-048-11	REMOTE COMMANDER	24
IC901	8-759-604-33	IC M5F7812	
IC902	8-759-604-51	IC M5F7912	
J301	1-566-818-11	JACK, PIN 4P (LINE OUT)	
J302	1-566-922-21	JACK, PIN 1P (DIGITAL OUT COAXIAL)	
Q950	8-729-820-15	TRANSISTOR 2SB1274	
S991	△1-570-156-11	SWITCH, PUSH (AC POWER)(1 KEY) (POWER)	
T901	△1-449-603-11	TRANSFORMER, POWER	

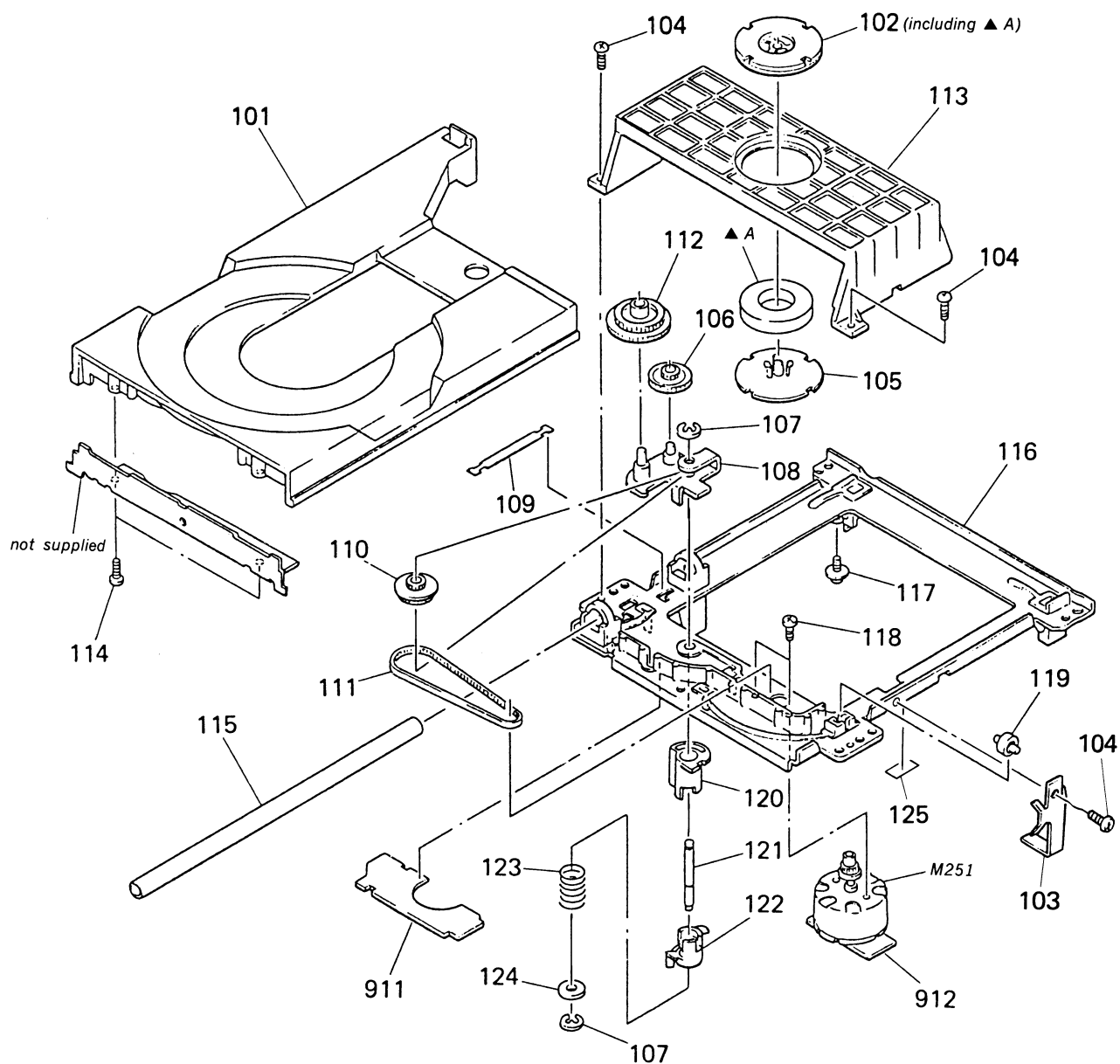
4-4. OPTICAL PICK-UP BLOCK SECTION
(BU-6B)



Note: The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

Ref.No	Part No.	Description	Remarks	Ref.No	Part No.	Description	Remarks
151	3-318-203-61	SCREW (B1.7X4), TAPPING		164	4-927-626-01	LEVER (L)	
152	*4-910-431-01	SHAFT, SLIDE		165	3-305-423-00	SPRING, COMPRESSION	
153	7-685-646-79	SCREW, TAPPING		166	*4-917-582-01	CUSHION, SLIDE	
154	*4-917-581-01	YOKE (B)		167	*4-927-637-01	HOLDER (BU-6)	
155	*4-917-580-01	YOKE (A)		168	4-927-627-01	ROLLER (S,G)	
156	7-685-134-19	SCREW +BTP 2.6X8 TYPE2 N-S		169	7-621-773-86	SCREW +BVT 2.6X4 (S)	
157	4-927-634-01	HOLDER (SP)		170	X-4927-605-3	M. BASE ASSY (including M252)	
158	4-917-562-01	INSULATOR		913	*1-452-411-11	MAGNET, LINEAR	
159	7-621-255-25	SCREW +P 2X4		914	1-422-302-11	COIL (DETECTION)	
160	4-917-572-01	SPRING (B)		915	1-422-301-11	COIL (DRIVING)	
161	4-917-573-01	SPRING (E)		916	*1-628-390-11	PC BOARD, TRANSLATION	
162	4-917-571-01	SPRING (A)		917	 8-848-047-01	PICK UP, OPTICS (KSS-151A)	
163	7-685-132-19	+ PTPWH (2.6X5)					

4-3. MECHANISM SECTION (CDM11B-6B)



Ref.No	Part No.	Description	Remarks
101	* 4-927-642-01	TABLE (EXL), DISK	
102	A-4665-024-A	MAGNET ASSY	
103	* 4-927-655-01	LIMITER	
104	7-621-770-67	SCREW +BVT 2.6X6 (S)	
105	* 4-918-679-04	PULLEY, PRESS	
106	4-927-628-01	GEAR (C)	
107	7-624-105-04	STOP RING 2.3, TYPE -E	
108	X-4927-608-1	ARM ASSY, SWING	
109	* 4-927-648-01	SLIDER (GROUND)	
110	4-929-724-01	PULLEY (B)	
111	4-927-649-01	BELT	
112	4-927-620-01	GEAR (P)	
113	* 4-927-638-03	HOLDER (A,P)	
114	7-685-647-79	SCREW +P 3X10 TYPE2 SLIT	

Ref.No	Part No.	Description	Remarks
115	4-927-617-01	BAR, GUIDE	
116	* 4-927-641-04	CHASSIS (OUTSERT), MECAHNICAL	
117	* 4-917-583-21	BRACKET, YOKE	
118	7-621-775-08	SCREW +P 2.6X3	
119	4-927-631-01	ROLLER (L)	
120	4-927-624-01	CAM (L,A)	
121	4-927-665-01	SHAFT (S)	
122	4-927-635-01	CAM (L,B)	
123	3-659-338-00	SPRING, COMPRESSION	
124	4-927-654-01	WASHER (LIMITER)	
125	3-831-441-XX	CUSHION	
911	* 1-629-360-11	PC BOARD, SWITCH	
912	* 1-629-359-11	PC BOARD, L.MOTOR	
M251	A-4608-362-A	MOTOR (L) ASSY (LOADING)	

Ref.No	Part No.	Description			
C408	1-123-333-00	ELECT	100MF	20%	25V
C409	1-123-333-00	ELECT	100MF	20%	25V
C411	1-123-333-00	ELECT	100MF	20%	25V
C421	1-123-382-00	ELECT	3.3MF	20%	63V
C422	1-123-382-00	ELECT	3.3MF	20%	63V
C423	1-123-382-00	ELECT	3.3MF	20%	63V
C424	1-123-382-00	ELECT	3.3MF	20%	63V
C451	1-126-103-11	ELECT	470MF	20%	16V
C452	1-161-494-00	CERAMIC	0.022MF	25V	
C453	1-164-159-11	CERAMIC	0.1MF	50V	
C460	1-161-379-00	CERAMIC	0.01MF	20%	16V
C501	1-136-250-11	FILM	0.001MF	3%	100V
C502	1-136-232-11	FILM	0.0043MF	3%	100V
C503	1-124-929-11	ELECT	22MF	20%	63V
C504	1-136-227-11	FILM	0.0011MF	3%	100V
C508	1-123-333-00	ELECT	100MF	20%	25V
C509	1-123-333-00	ELECT	100MF	20%	25V
C511	1-123-333-00	ELECT	100MF	20%	25V
C521	1-123-382-00	ELECT	3.3MF	20%	63V
C522	1-123-382-00	ELECT	3.3MF	20%	63V
C523	1-123-382-00	ELECT	3.3MF	20%	63V
C524	1-123-382-00	ELECT	3.3MF	20%	63V
C551	1-126-103-11	ELECT	470MF	20%	16V
C552	1-161-494-00	CERAMIC	0.022MF	25V	
C560	1-161-379-00	CERAMIC	0.01MF	20%	16V
C803	1-164-159-11	CERAMIC	0.1MF	50V	
C804	1-126-177-11	ELECT	100MF	20%	6.3V
C805	1-164-159-11	CERAMIC	0.1MF	50V	
C901	1-126-549-11	ELECT	4700MF	20%	25V
C902	1-126-549-11	ELECT	4700MF	20%	25V
C903	1-123-377-00	ELECT	470MF	20%	63V
C904	1-123-377-00	ELECT	470MF	20%	63V
C905	1-123-333-00	ELECT	100MF	20%	25V
C950	1-124-898-11	ELECT	4700MF	20%	16V
C951	1-124-898-11	ELECT	4700MF	20%	16V
C952	1-123-875-11	ELECT	10MF	20%	50V
C953	1-124-927-11	ELECT	4.7MF	20%	50V
C954	1-124-472-11	ELECT	470MF	20%	10V
C955	1-124-893-11	ELECT	2200MF	20%	10V
C956	1-126-534-11	ELECT	47000MF	5.5V	
C957	1-161-379-00	CERAMIC	0.01MF	20%	16V
C958	1-124-572-11	ELECT	100MF	20%	63V
C959	1-124-927-11	ELECT	4.7MF	20%	50V
C960	1-124-572-11	ELECT	100MF	20%	63V
C961	1-123-382-00	ELECT	3.3MF	20%	50V
C991	△ 1-161-744-00	CERAMIC	0.01MF	400V	
C992	△ 1-162-599-12	CERAMIC	0.0047MF	20%	400V
C993	△ 1-162-599-12	CERAMIC	0.0047MF	20%	400V
CN101	* 1-564-338-71	PIN, CONNECTOR 4P			
CN102	* 1-564-340-00	PIN, CONNECTOR 6P			
CN110	* 1-562-883-11	SOCKET, CONNECTOR 20P			
CN201	* 1-564-340-61	PIN, CONNECTOR 6P			
CN203	* 1-564-338-00	PIN, CONNECTOR 4P			
CN204	* 1-564-338-81	PIN, CONNECTOR 4P			
CN301	* 1-564-342-11	PIN, CONNECTOR 8P			
CN302	* 1-564-339-00	PIN, CONNECTOR 5P			
CN303	* 1-564-337-00	PIN, CONNECTOR 3P			
CN401	* 1-564-705-11	PIN, CONNECTOR (SMALL TYPE) 3P			
CN402	* 1-564-705-11	PIN, CONNECTOR (SMALL TYPE) 3P			
CN403	* 1-564-705-11	PIN, CONNECTOR (SMALL TYPE) 3P			
CN901	* 1-564-341-11	PIN, CONNECTOR 7P			
CN902	* 1-564-512-11	PLUG, CONNECTOR 9P			
D101	8-719-107-94	DIODE 1SS202-1			
D381	8-719-107-94	DIODE 1SS202-1			
D391	8-719-970-49	DIODE BR4361F			

Ref.No	Part No.	Description
D802	8-719-971-70	DIODE BR3867S
D901	8-719-230-02	DIODE 30DF2
D902	8-719-230-02	DIODE 30DF2
D903	8-719-230-02	DIODE 30DF2
D904	8-719-230-02	DIODE 30DF2
D950	8-719-230-02	DIODE 10E2
D951	8-719-200-02	DIODE 10E2
D952	8-719-200-02	DIODE 10E2
D953	8-719-200-02	DIODE 10E2
D955	8-719-934-26	DIODE HZS33-2L
D956	8-719-933-57	DIODE HZS9B2L
D957	8-719-107-94	DIODE 1SS202-1
D958	8-719-200-02	DIODE 10E2
D961	8-719-107-94	DIODE 1SS202-1
D962	8-719-107-94	DIODE 1SS202-1
FLD801	1-519-476-11	INDICATOR TUBE, FLUORESCENT
IC101	8-752-034-00	IC CXA1081S
IC201	8-752-035-28	IC CXA1291P
IC202	8-752-035-28	IC CXA1291P
IC204	8-752-032-33	IC CXA1182S
IC302	8-752-328-62	IC CXD1125Q
IC303	8-752-323-64	IC CXK5816M-12L
IC351	8-759-631-47	IC M50747-161SP
IC352	8-759-820-64	IC LC9600R-183
IC353	8-759-978-53	IC CXD8003S
IC354	8-752-328-61	IC CXD1244S
IC356	8-759-202-11	IC TC74HC00P
IC357	8-759-977-71	IC GP1F31T (DIGITAL OUT OPTICAL)
IC358	8-759-981-85	IC RC4556D
IC391	8-759-962-08	IC BA6208
IC401	8-759-979-08	IC PCM58P-J
IC402	8-759-982-03	IC RC5532D-D
IC501	8-759-979-08	IC PCM58P-J
IC502	8-759-982-03	IC RC5532D-D
IC801	8-752-808-95	IC CXP5058H-603Q
IC802	8-749-920-03	IC GP1U52
IC901	8-759-604-33	IC M5F7812
IC902	8-759-604-51	IC M5F7912
IC903	8-759-604-29	IC M5F7805
IC905	8-759-630-21	IC M5290P-16
J301	1-566-818-11	JACK, PIN 4P (LINE OUT)
J302	1-566-922-21	JACK, PIN 1P (DIGITAL OUT COAXIAL)
J303	1-507-796-61	JACK, LARGE TYPE (PHONES)
L301	* 1-410-858-11	INDUCTOR 0UH
L302	* 1-410-858-11	INDUCTOR 0UH
L303	1-410-953-11	INDUCTOR, SMALL TYPE
L310	* 1-410-858-11	INDUCTOR 0UH
L311	* 1-410-858-11	INDUCTOR 0UH
L312	* 1-410-858-11	INDUCTOR 0UH
L313	1-410-953-11	INDUCTOR, SMALL TYPE
L314	* 1-410-858-11	INDUCTOR 0UH
L351	* 1-410-858-11	INDUCTOR 0UH
L352	* 1-410-858-11	INDUCTOR 0UH
L353	* 1-410-858-11	INDUCTOR 0UH
L354	* 1-410-858-11	INDUCTOR 0UH
L355	* 1-410-858-11	INDUCTOR 0UH
L356	* 1-410-858-11	INDUCTOR 0UH
L390	* 1-410-858-11	INDUCTOR 0UH
L391	* 1-410-858-11	INDUCTOR 0UH
L991	△ 1-421-915-11	COIL, LINE FILTER
M251	A-4608-362-A	MOTOR (L) ASSY (LOADING)
Q101	8-729-140-97	TRANSISTOR 2SB734-34
Q205	8-729-900-80	TRANSISTOR DTC114ES

Note: The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

SECTION 5 ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:MF: μ F, PF: μ F.**RESISTORS**

- All resistors are in ohms.
- F: nonflammable

COILS

- MMH: mH, UH: μ H

SEMICONDUCTORSIn each case, U: μ , for example:UA....: μ A..., UPA....: μ PA...,UPC....: μ PC, UPD....: μ PD...

The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

Ref.No	Part No.	Description	Ref.No	Part No.	Description
901	* A-4618-226-A	MOUNTED PCB, MAIN	C219	1-136-159-00	FILM
902	* 1-628-937-11	PC BOARD, TRANSFORMER	C220	1-136-165-00	FILM
903	* 1-628-936-11	PC BOARD, POWER SWITCH	C221	1-130-479-00	MYLAR
904	* 1-535-688-11	TERMINAL	C222	1-124-499-11	ELECT
905	Δ 1-555-795-00	(AEP)....CORD, POWER	C223	1-124-927-11	ELECT
906	Δ 1-556-035-00	(UK)....CORD, POWER	C224	1-126-233-11	ELECT
907	* 1-628-408-11	PC BOARD, MOTOR	C225	1-162-294-31	CERAMIC
908	* 1-628-409-11	PC BOARD, HEADPHONE JACK	C226	1-162-282-31	CERAMIC
909	* 1-628-410-11	PC BOARD, TIMER SWITCH	C227	1-126-233-11	ELECT
910	* A-4655-077-A	MOUNTED PCB, DISPLAY	C228	1-130-472-00	MYLAR
911	* 1-629-360-11	PC BOARD, SWITCH	C229	1-164-159-11	CERAMIC
912	* 1-629-359-11	PC BOARD, L.MOTOR	C230	1-130-479-00	MYLAR
913	* 1-452-411-11	MAGNET, LINEAR	C231	1-126-233-11	ELECT
914	1-422-302-11	COIL (DETECTION)	C232	1-164-159-11	CERAMIC
915	1-422-301-11	COIL (DRIVING)	C233	1-162-294-31	CERAMIC
916	* 1-628-390-11	PC BOARD, TRANSLATION	C234	1-162-294-31	CERAMIC
917	Δ 8-848-047-01	PICK UP, OPTICS (KSS-151A)	C251	1-136-157-00	FILM
918	* 1-628-407-11	PC BOARD, VR	C252	1-136-157-00	FILM
919	1-465-048-11	REMOTE COMMANDER	C302	1-126-233-11	ELECT
CAPACITOR					
C101	1-164-088-11	CERAMIC	C304	1-124-902-00	ELECT
C102	1-124-478-11	ELECT	C305	1-136-159-00	FILM
C103	1-162-199-31	CERAMIC	C306	1-162-179-11	CERAMIC
C104	1-162-199-31	CERAMIC	C307	1-164-159-11	CERAMIC
C106	1-164-159-11	CERAMIC	C308	1-164-159-11	CERAMIC
C107	1-130-477-00	MYLAR	C309	1-164-159-11	CERAMIC
C108	1-136-159-00	FILM	C310	1-162-294-31	CERAMIC
C109	1-164-159-11	CERAMIC	C321	1-164-159-11	CERAMIC
C110	1-126-233-11	ELECT	C322	1-164-159-11	CERAMIC
C111	1-136-153-00	FILM	C323	1-164-159-11	CERAMIC
C112	1-136-153-00	FILM	C325	1-161-379-00	CERAMIC
C113	1-126-233-11	ELECT	C354	1-162-179-11	CERAMIC
C114	1-164-159-11	CERAMIC	C360	1-162-199-31	CERAMIC
C115	1-161-375-00	CERAMIC	C361	1-162-203-31	CERAMIC
C116	1-130-480-00	MYLAR	C362	1-162-294-31	CERAMIC
C117	1-124-902-00	ELECT	C363	1-164-159-11	CERAMIC
C200	1-161-379-00	CERAMIC	C364	1-164-159-11	CERAMIC
C201	1-124-478-11	ELECT	C365	1-164-159-11	CERAMIC
C202	1-124-478-11	ELECT	C366	1-126-233-11	ELECT
C203	1-164-159-11	CERAMIC	C367	1-164-159-11	CERAMIC
C204	1-164-159-11	CERAMIC	C368	1-162-282-31	CERAMIC
C205	1-162-294-31	CERAMIC	C369	1-126-233-11	ELECT
C206	1-162-294-31	CERAMIC	C370	1-126-233-11	ELECT
C207	1-164-159-11	CERAMIC	C371	1-162-282-31	CERAMIC
C208	1-136-155-00	FILM	C372	1-164-159-11	CERAMIC
C209	1-136-161-00	FILM	C390	1-162-294-31	CERAMIC
C210	1-164-159-11	CERAMIC	C391A	1-124-768-11	ELECT
C211	1-164-159-11	CERAMIC	C391B	1-162-294-31	CERAMIC
C212	1-124-478-11	ELECT	C392	1-162-294-31	CERAMIC
C213	1-124-478-11	ELECT	C393	1-162-294-31	CERAMIC
C215	1-126-233-11	ELECT	C396	1-162-215-31	CERAMIC
C216	1-123-382-00	ELECT	C401	1-136-250-11	FILM
C217	1-136-165-00	FILM	C402	1-136-232-11	FILM
C218	1-123-382-00	ELECT	C403	1-124-929-11	ELECT
			C404	1-136-227-11	FILM

CDP-228ESD

Ref.No	Part No.	Description			
R808	1-249-422-11	CARBON	2.7K	5%	1/4W
R809	1-249-424-11	CARBON	3.9K	5%	1/4W
R810	1-249-424-11	CARBON	3.9K	5%	1/4W
R811	1-249-424-11	CARBON	3.9K	5%	1/4W
R812	1-249-424-11	CARBON	3.9K	5%	1/4W
R813	1-249-424-11	CARBON	3.9K	5%	1/4W
R814	1-249-424-11	CARBON	3.9K	5%	1/4W
R815	1-249-424-11	CARBON	3.9K	5%	1/4W
R816	1-249-424-11	CARBON	3.9K	5%	1/4W
R817	1-249-427-11	CARBON	6.8K	5%	1/4W
R818	1-249-427-11	CARBON	6.8K	5%	1/4W
R819	1-249-427-11	CARBON	6.8K	5%	1/4W
R820	1-249-427-11	CARBON	6.8K	5%	1/4W
R821	1-249-427-11	CARBON	6.8K	5%	1/4W
R822	1-249-427-11	CARBON	6.8K	5%	1/4W
R823	1-249-427-11	CARBON	6.8K	5%	1/4W
R824	1-249-427-11	CARBON	6.8K	5%	1/4W
R825	1-249-432-11	CARBON	18K	5%	1/4W
R826	1-249-432-11	CARBON	18K	5%	1/4W
R827	1-249-432-11	CARBON	18K	5%	1/4W
R828	1-249-432-11	CARBON	18K	5%	1/4W
R829	1-249-432-11	CARBON	18K	5%	1/4W
R830	1-249-432-11	CARBON	18K	5%	1/4W
R831	1-249-432-11	CARBON	18K	5%	1/4W
R832	1-249-432-11	CARBON	18K	5%	1/4W
R833	1-249-429-11	CARBON	10K	5%	1/4W
R834	1-249-429-11	CARBON	10K	5%	1/4W
R835	1-249-429-11	CARBON	10K	5%	1/4W
R836	1-249-429-11	CARBON	10K	5%	1/4W
R837	1-249-429-11	CARBON	10K	5%	1/4W
R838	1-249-429-11	CARBON	10K	5%	1/4W
R839	1-249-429-11	CARBON	10K	5%	1/4W
R840	1-249-429-11	CARBON	10K	5%	1/4W
R841	1-249-429-11	CARBON	10K	5%	1/4W
R842	1-249-429-11	CARBON	10K	5%	1/4W
R843	1-249-429-11	CARBON	10K	5%	1/4W
R845	1-249-429-11	CARBON	10K	5%	1/4W
R846	1-249-429-11	CARBON	10K	5%	1/4W
R847	1-249-429-11	CARBON	10K	5%	1/4W
R848	1-249-429-11	CARBON	10K	5%	1/4W
R849	1-249-441-11	CARBON	100K	5%	1/4W
R850	1-249-429-11	CARBON	10K	5%	1/4W
R851	1-249-411-11	CARBON	330	5%	1/4W
R852	1-249-411-11	CARBON	330	5%	1/4W
R853	1-249-429-11	CARBON	10K	5%	1/4W
R901	1-247-702-11	CARBON	150	5%	1/4W
R902	1-247-702-11	CARBON	150	5%	1/4W
R903	1-249-401-11	CARBON	47	5%	1/4W
R904	1-249-401-11	CARBON	47	5%	1/4W
R905	1-249-421-11	CARBON	2.2K	5%	1/4W
R906	1-249-421-11	CARBON	2.2K	5%	1/4W
R951	1-249-425-11	CARBON	4.7K	5%	1/4W
R952	1-249-425-11	CARBON	4.7K	5%	1/4W
R953	1-249-429-11	CARBON	10K	5%	1/4W
R954	1-249-405-11	CARBON	100	5%	1/4W
R955	1-249-425-11	CARBON	4.7K	5%	1/4W
R956	△1-212-869-00	FUSIBLE	33	5%	1/4W
R961	1-249-433-11	CARBON	22K	5%	1/4W
R962	1-249-433-11	CARBON	22K	5%	1/4W
R970	1-249-429-11	CARBON	10K	5%	1/4W
RV101	1-238-398-11	RES. ADJ. METAL GLAZE 20K			
RV102	1-228-995-00	RES. ADJ. CARBON 20K			
RV103	1-228-995-00	RES. ADJ. CARBON 20K			
RV104	1-238-396-11	RES. ADJ. METAL GLAZE 5K			
RV201	1-238-394-11	RES. ADJ. METAL GLAZE 1K			

Note: The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

Ref.No	Part No.	Description
RV451	1-238-315-21	RES. VAR. CARBON 10K/10K (LINE OUT) (INCLUDING VOL MOTOR)
RY401	1-515-614-11	RELAY
S251	1-571-736-11	SWITCH, LEAF (OUT SW)
S252	1-571-736-11	SWITCH, LEAF (IN SW)
S801	1-554-596-21	SWITCH, KEY BOARD (1)
S802	1-554-596-21	SWITCH, KEY BOARD (2)
S803	1-554-596-21	SWITCH, KEY BOARD (3)
S804	1-554-596-21	SWITCH, KEY BOARD (4)
S805	1-554-596-21	SWITCH, KEY BOARD (5)
S806	1-554-596-21	SWITCH, KEY BOARD (6)
S807	1-554-596-21	SWITCH, KEY BOARD (7)
S808	1-554-596-21	SWITCH, KEY BOARD (8)
S809	1-554-596-21	SWITCH, KEY BOARD (9)
S810	1-554-596-21	SWITCH, KEY BOARD (10)
S811	1-554-596-21	SWITCH, KEY BOARD (11)
S812	1-554-596-21	SWITCH, KEY BOARD (12)
S813	1-554-596-21	SWITCH, KEY BOARD (13)
S814	1-554-596-21	SWITCH, KEY BOARD (14)
S815	1-554-596-21	SWITCH, KEY BOARD (15)
S816	1-554-596-21	SWITCH, KEY BOARD (16)
S817	1-554-596-21	SWITCH, KEY BOARD (17)
S818	1-554-596-21	SWITCH, KEY BOARD (18)
S819	1-554-596-21	SWITCH, KEY BOARD (19)
S820	1-554-596-21	SWITCH, KEY BOARD (20)
S821	1-554-596-21	SWITCH, KEY BOARD (PLAY MODE C. INDEX)
S822	1-554-596-21	SWITCH, KEY BOARD (>20)
S823	1-554-596-21	SWITCH, KEY BOARD (EDIT/TIME FADE)
S824	1-554-596-21	SWITCH, KEY BOARD (ERASE)
S825	1-554-596-21	SWITCH, KEY BOARD (CLEAR)
S826	1-554-596-21	SWITCH, KEY BOARD (CHECK)
S827	1-554-596-21	SWITCH, KEY BOARD (▶▶)
S828	1-554-596-21	SWITCH, KEY BOARD (◀◀)
S829	1-554-596-21	SWITCH, KEY BOARD (FILE RECALL)
S830	1-554-596-21	SWITCH, KEY BOARD (FADER)
S831	1-554-596-21	SWITCH, KEY BOARD (II)
S832	1-554-596-21	SWITCH, KEY BOARD (■)
S833	1-554-596-21	SWITCH, KEY BOARD (K◀)
S834	1-554-596-21	SWITCH, KEY BOARD (▶▶)
S835	1-554-596-21	SWITCH, KEY BOARD (FILE)
S836	1-554-596-21	SWITCH, KEY BOARD (TIME/MODE)
S837	1-554-596-21	SWITCH, KEY BOARD (AUTO SPACE)
S838	1-554-596-21	SWITCH, KEY BOARD (REPEAT)
S839	1-554-596-21	SWITCH, KEY BOARD (▷)
S840	1-554-596-21	SWITCH, KEY BOARD (△OPEN/CLOSE)
S841	1-554-596-21	SWITCH, KEY BOARD (CONTINUE/SINGLE)
S842	1-554-596-21	SWITCH, KEY BOARD (SHUFFLE)
S843	1-554-596-21	SWITCH, KEY BOARD (PROGRAM)
S844	1-554-419-00	SWITCH, PUSH (1 KEY) (DIGITAL OUTPUT)
S845	1-554-481-00	SWITCH, SLIDE (TIMER)
S991	△1-570-156-11	SWITCH, PUSH (AC POWER)(1 KEY) (POWER)
T901	△1-449-603-11	TRANSFORMER, POWER
X301	1-577-157-11	VIBRATOR, CERAMIC 8MHz
X352	1-567-926-11	VIBRATOR, CRYSTAL 16.9344MHz
X801	1-577-082-11	VIBRATOR, CERAMIC 4MHz

ACCESSORY & PACKING MATERIALS

- 1-558-271-11 CORD, CONNECTION
- * 3-704-343-01 SHEET (STANDARD), PROTECTION (UK).....MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE)
- 3-786-738-11 (AEP).....MANUAL, INSTRUCTION (GERMAN, DUTCH, SWEDISH, ITALIAN)
- * 3-795-629-11 (AEP).....INSTRUCTION
- 4-923-540-01 CUSHION
- * 4-927-645-41 INDIVIDUAL CARTON
- * 4-929-016-01 STOPPER, DISK TABLE

English

89D0449-1

Printed in Japan

©1989. 4

9-953-526-11

Sony Corporation
Audio Group

Ref.No	Part No.	Description			
Q206	8-729-900-80	TRANSISTOR DTC114ES			
Q381	8-729-900-61	TRANSISTOR DTA114ES			
Q382	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q383	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q801	8-729-902-11	TRANSISTOR 2SC2021-Q			
Q802	8-729-900-45	TRANSISTOR DTC114EF			
Q901	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q902	8-729-119-76	TRANSISTOR 2SA1175-HFE			
Q950	8-729-820-15	TRANSISTOR 2SB1274			
Q951	8-729-177-42	TRANSISTOR 2SD774-3			
Q952	8-729-140-97	TRANSISTOR 2SB734-34			
Q961	8-729-119-78	TRANSISTOR 2SC2785-HFE			
RESISTOR					
R101	1-247-806-11	CARBON	91	5%	1/4W
R102	1-249-512-11	CARBON	22	5%	1/4W
R103	1-249-417-11	CARBON	1K	5%	1/4W
R104	1-249-433-11	CARBON	22K	5%	1/4W
R106	1-249-428-11	CARBON	8.2K	5%	1/4W
R107	1-247-860-11	CARBON	16K	5%	1/4W
R108	1-249-425-11	CARBON	4.7K	5%	1/4W
R109	1-249-425-11	CARBON	4.7K	5%	1/4W
R110	1-249-432-11	CARBON	18K	5%	1/4W
R111	1-249-432-11	CARBON	18K	5%	1/4W
R112	1-249-441-11	CARBON	100K	5%	1/4W
R201	1-249-393-11	CARBON	10	5%	1/4W
R203	1-249-393-11	CARBON	10	5%	1/4W
R205	1-249-441-11	CARBON	100K	5%	1/4W
R206	1-247-881-00	CARBON	120K	5%	1/4W
R208	1-249-441-11	CARBON	100K	5%	1/4W
R210	1-247-881-00	CARBON	120K	5%	1/4W
R211	1-249-437-11	CARBON	47K	5%	1/4W
R212	1-249-435-11	CARBON	33K	5%	1/4W
R214	1-247-846-11	CARBON	4.3K	5%	1/4W
R216	1-249-393-11	CARBON	10	5%	1/4W
R217	1-247-899-11	CARBON	680K	5%	1/4W
R218	1-249-441-11	CARBON	100K	5%	1/4W
R219	1-249-424-11	CARBON	3.9K	5%	1/4W
R222	1-247-882-11	CARBON	130K	5%	1/4W
R223	1-249-393-11	CARBON	10	5%	1/4W
R224	1-249-393-11	CARBON	10	5%	1/4W
R228	1-247-896-11	CARBON	510K	5%	1/4W
R229	1-249-431-11	CARBON	15K	5%	1/4W
R230	1-249-440-11	CARBON	82K	5%	1/4W
R231	1-249-440-11	CARBON	82K	5%	1/4W
R232	1-249-429-11	CARBON	10K	5%	1/4W
R233	1-249-414-11	CARBON	560	5%	1/4W
R234	1-249-441-11	CARBON	100K	5%	1/4W
R235	1-215-434-00	METAL	3.6K	1%	1/6W
R236	1-249-433-11	CARBON	22K	5%	1/4W
R237	1-249-441-11	CARBON	100K	5%	1/4W
R238	1-249-417-11	CARBON	1K	5%	1/4W
R239	1-249-417-11	CARBON	1K	5%	1/4W
R240	1-249-417-11	CARBON	1K	5%	1/4W
R241	1-249-417-11	CARBON	1K	5%	1/4W
R243	1-247-854-11	CARBON	9.1K	5%	1/4W
R244	1-247-854-11	CARBON	9.1K	5%	1/4W
R301	1-247-903-00	CARBON	1M	5%	1/4W
R303	1-215-469-00	METAL	100K	1%	1/6W
R304	1-215-469-00	METAL	100K	1%	1/6W
R305	1-249-429-11	CARBON	10K	5%	1/4W
R306	1-249-441-11	CARBON	100K	5%	1/4W
R307	1-249-429-11	CARBON	10K	5%	1/4W
R308	1-249-417-11	CARBON	1K	5%	1/4W
R309	1-249-433-11	CARBON	22K	5%	1/4W

Ref.No	Part No.	Description			
R310	1-247-903-00	CARBON	1M	5%	1/4W
R311	1-249-429-11	CARBON	10K	5%	1/4W
R312	1-249-429-11	CARBON	10K	5%	1/4W
R313	1-249-429-11	CARBON	10K	5%	1/4W
R314	1-249-429-11	CARBON	10K	5%	1/4W
R315	1-249-429-11	CARBON	10K	5%	1/4W
R316	1-249-429-11	CARBON	10K	5%	1/4W
R317	1-249-429-11	CARBON	10K	5%	1/4W
R318	1-249-429-11	CARBON	10K	5%	1/4W
R319	1-249-429-11	CARBON	10K	5%	1/4W
R320	1-249-429-11	CARBON	10K	5%	1/4W
R321	1-249-429-11	CARBON	10K	5%	1/4W
R322	1-249-429-11	CARBON	10K	5%	1/4W
R323	1-249-429-11	CARBON	10K	5%	1/4W
R327	1-249-417-11	CARBON	1K	5%	1/4W
R330	1-249-417-11	CARBON	1K	5%	1/4W
R351	1-249-413-11	CARBON	470	5%	1/4W
R352	1-249-417-11	CARBON	1K	5%	1/4W
R353	1-249-417-11	CARBON	1K	5%	1/4W
R354	1-249-417-11	CARBON	1K	5%	1/4W
R356	1-249-417-11	CARBON	1K	5%	1/4W
R357	1-249-417-11	CARBON	1K	5%	1/4W
R358	1-249-417-11	CARBON	1K	5%	1/4W
R359	1-249-417-11	CARBON	1K	5%	1/4W
R360	1-249-405-11	CARBON	100	5%	1/4W
R361	1-249-393-11	CARBON	10	5%	1/4W
R362	1-249-413-11	CARBON	470	5%	1/4W
R363	1-249-413-11	CARBON	470	5%	1/4W
R364	1-247-903-00	CARBON	1M	5%	1/4W
R365	1-259-417-11	CARBON	360	5%	1/6W
R366	1-259-403-11	CARBON	91	5%	1/6W
R367	1-249-407-11	CARBON	150	5%	1/4W
R370	1-249-417-11	CARBON	1K	5%	1/4W
R371	1-249-417-11	CARBON	1K	5%	1/4W
R381	1-249-441-11	CARBON	100K	5%	1/4W
R382	1-249-416-11	CARBON	820	5%	1/4W
R401	1-259-440-11	CARBON	3.3K	5%	1/6W
R402	1-259-432-11	CARBON	1.5K	5%	1/6W
R403	1-259-432-11	CARBON	1.5K	5%	1/6W
R404	1-259-488-11	CARBON	330K	5%	1/6W
R405	1-259-404-11	CARBON	100	5%	1/6W
R410	1-259-404-11	CARBON	100	5%	1/6W
R411	1-259-404-11	CARBON	100	5%	1/6W
R451	1-259-452-11	CARBON	10K	5%	1/6W
R452	1-259-464-11	CARBON	33K	5%	1/6W
R453	1-259-394-11	CARBON	39	5%	1/6W
R454	1-259-464-11	CARBON	33K	5%	1/6W
R501	1-259-440-11	CARBON	3.3K	5%	1/6W
R502	1-259-432-11	CARBON	1.5K	5%	1/6W
R503	1-259-432-11	CARBON	1.5K	5%	1/6W
R504	1-259-488-11	CARBON	330K	5%	1/6W
R505	1-259-404-11	CARBON	100	5%	1/6W
R510	1-259-404-11	CARBON	100	5%	1/6W
R511	1-259-404-11	CARBON	100	5%	1/6W
R551	1-259-452-11	CARBON	10K	5%	1/6W
R552	1-259-464-11	CARBON	33K	5%	1/6W
R553	1-259-394-11	CARBON	39	5%	1/6W
R554	1-259-464-11	CARBON	33K	5%	1/6W
R801	1-249-422-11	CARBON	2.7K	5%	1/4W
R802	1-249-422-11	CARBON	2.7K	5%	1/4W
R803	1-249-422-11	CARBON	2.7K	5%	1/4W
R804	1-249-422-11	CARBON	2.7K	5%	1/4W
R805	1-249-422-11	CARBON	2.7K	5%	1/4W
R806	1-249-422-11	CARBON	2.7K	5%	1/4W
R807	1-249-422-11	CARBON	2.7K	5%	1/4W